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AUGUST 1911

$2.00 per year
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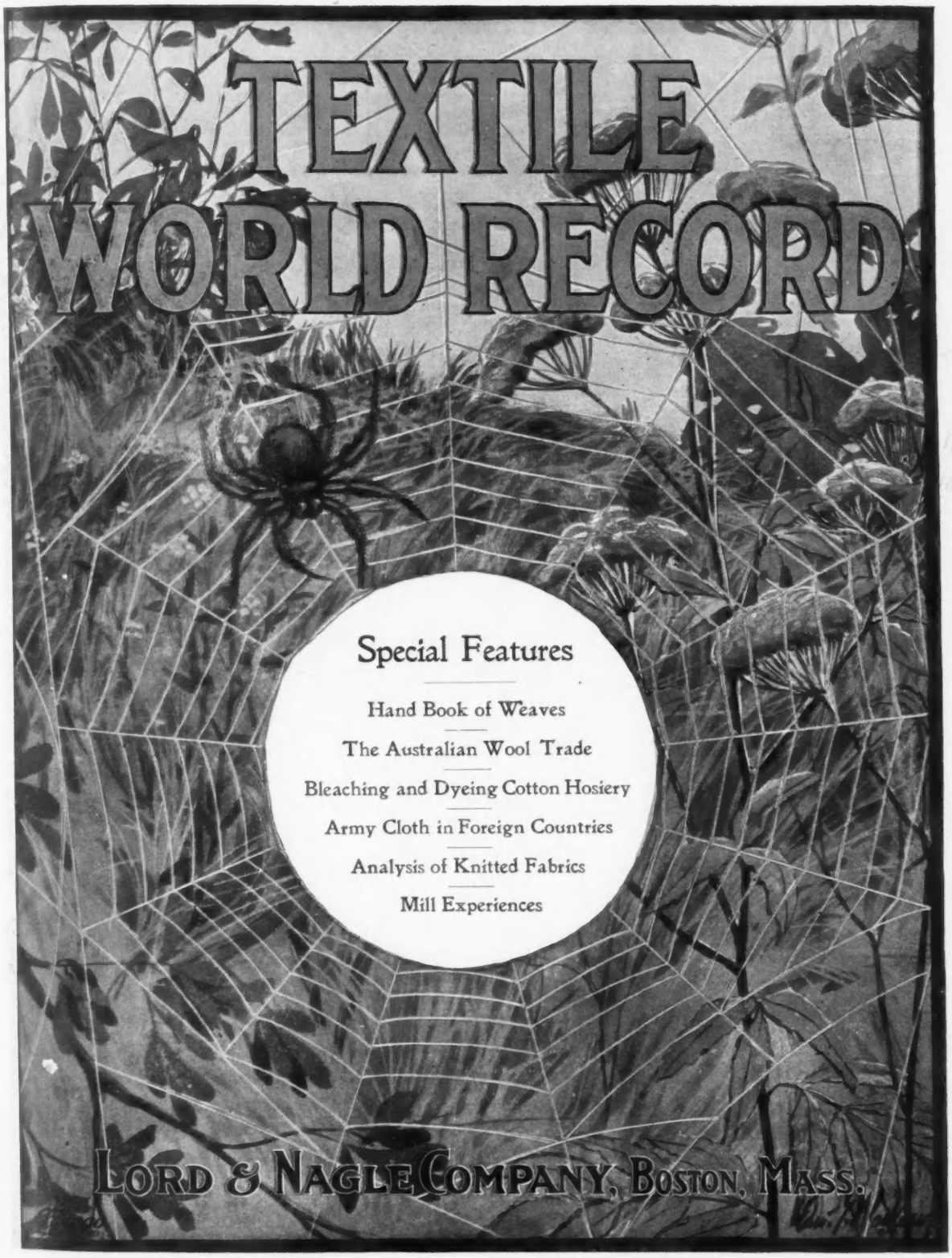


Table of Contents Page 59 Buyers Index Page 163 Index to Advertisements Page 173

The TEXTILE-FINISHING MACHINERY CO.

Howard Building, Providence, R. I.

BUILDERS OF

Bleaching, Mercerizing, Drying, Printing and Finishing Machinery

FOR

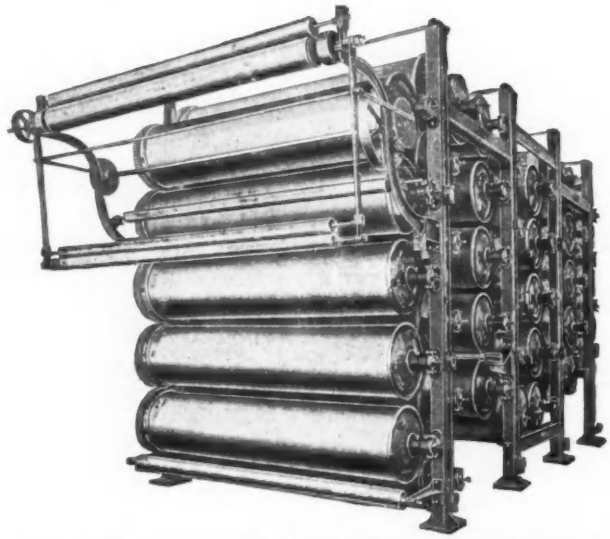
Textile Fabrics and Warps

PLANS AND ESTIMATES FOR COMPLETE PLANTS

It is impossible to fully cover the machinery we build in an advertisement or to even mention the many improvements or new machines we are constantly designing and building for the great variety of processes necessary in treating textile fabrics for the numerous purposes to which these are put in modern life. We have expert engineers and expert textile finishers in our employ. If you will write stating as clearly as possible the class of goods you wish to finish, the amount of yards or pounds per day, the width of woven goods, etc., full information will be sent to you, or one of our experts will call upon you and go over the question of equipment in person. We are the largest builders of this class of machinery in the United States.

Something new every month

Patent double roller automatic universal tenter clips, equally efficient with silk goods and cotton goods of all weights. The only universal clip on the market.



UPRIGHT DRYING MACHINE

We build all kinds of horizontal and upright cylinder drying machines. The cylinders are made either from the best imported English tinned iron or best Lake Superior sheet copper. Our patent spiral scoops keep the cylinders free from water, thereby largely increasing the drying capacity of the cylinders and are far superior to the old fashioned bucket scoops.

DRYERS especially designed for NARROW FABRICS, COTTON, WOOLEN and WORSTED GOODS and COTTON WARPS

Contents for August

	PAGE
Monthly Comment	61
Col. Albert Clarke	66
Australian Wool Trade	67
Cotton Spinners' and Doublers' Association	73
Scientific Management	74
A Course in Mill Accounting	75
The New Duneau Mills	76
Middle States Textile Association	76
Water for Industrial Purposes	77
Knotted Hemp	78
That First Overseer's Position	79
CORRESPONDENCE AND NOTES	81
A Hand Book of Weaves—English Notes—A Woolen Blanket Mill—The Evener Motion.	
QUESTIONS AND ANSWERS	99
KNITTING DEPARTMENT	105
The Knit Goods Situation—Analysis of Knitted Fabrics—Attachment for Circular Knitting Machines—Depreciation of Knitting Machinery—Stop Motion for Knitting Machines.	
DYEING, BLEACHING, FINISHING, ETC.	114
After Treatment of Substantive Dyes—Practical Dyeing—Bleaching and Dyeing Cotton Hosiery—Hydron Blue, Patented—Action of Light on Dyed Shades—Dye Recipes	
NEW MACHINERY AND PROCESSES	126
MILL NEWS	140
PERSONALS	146
NEW PUBLICATIONS	152
BUSINESS LITERATURE	152
NEW COLOR CARDS	153
INDUSTRIAL NOTES	153
RECENT TEXTILE PATENTS	160
WOOL MARKET	187
BRADFORD MARKET	189
COTTON MARKET	191
YARN MARKET	193
RAG AND SHODDY MARKET	200
SILK MARKET	203
DYESTUFFS AND CHEMICALS	209
MILL STOCKS	213

Correspondence

We solicit correspondence on textile subjects. Articles accepted will be paid for. Name and address must always be given, not necessarily for publication. Subscribers are invited to make free use of our Questions and Answers Department; correspondence is strictly confidential.

Contents for August

	PAGE
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Water for Industrial Purposes	77
Knotted Hemp	78
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NEW MACHINERY AND PROCESSES	126
MILL NEWS	140
PERSONALS	146
NEW PUBLICATIONS	152
BUSINESS LITERATURE	152
NEW COLOR CARDS	153
INDUSTRIAL NOTES	153
RECENT TEXTILE PATENTS	160
WOOL MARKET	187
BRADFORD MARKET	189
COTTON MARKET	191
YARN MARKET	193
RAG AND SHODDY MARKET	200
SILK MARKET	203
DYESTUFFS AND CHEMICALS	209
MILL STOCKS	213

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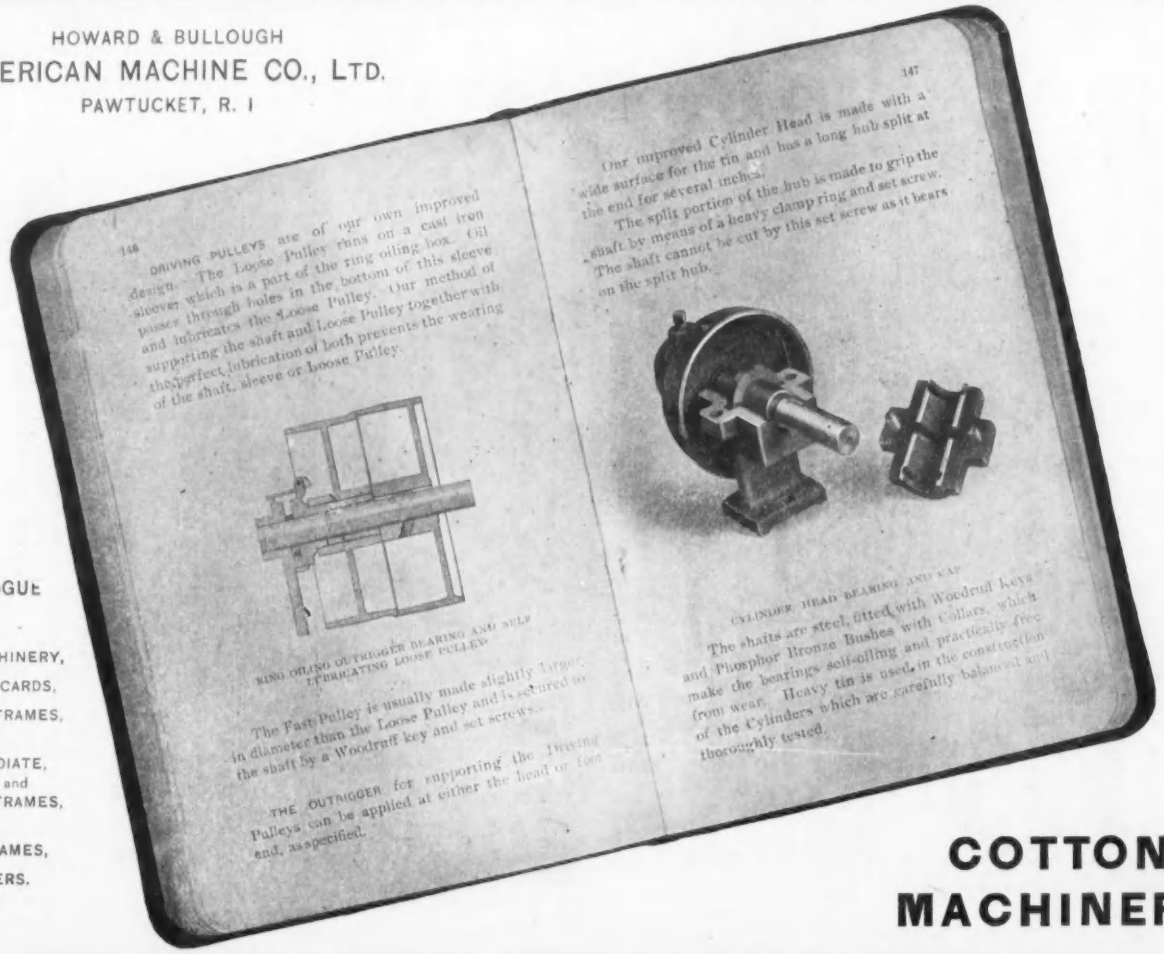
HOWARD & BULLOUGH
AMERICAN MACHINE CO., LTD.
PAWTUCKET, R. I


148
DRIVING PULLEYS are of our own improved design. The Loose Pulley runs on a cast iron sleeve which is a part of the ring oiling box. Oil passes through holes in the bottom of this sleeve and lubricates the Loose Pulley. Our method of supporting the shaft and Loose Pulley together with the perfect lubrication of both prevents the wearing of the shaft, sleeve or Loose Pulley.
RING OILING OUTRIGGER BEARING AND SELF LUBRICATING LOOSE PULLEY
The Fast Pulley is usually made slightly larger in diameter than the Loose Pulley and is secured to the shaft by a Woodruff key and set screws.
THE OUTRIGGER for supporting the Driving Pulleys can be applied at either the head or foot end, as specified.
147
Our improved Cylinder Head is made with a wide surface for the tin and has a long hub split at the end for several inches.
The split portion of the hub is made to grip the shaft by means of a heavy clamp ring and set screw. The shaft cannot be cut by this set screw as it bears on the split hub.
CYLINDER HEAD BEARING AND CAP
The shafts are steel, fitted with Woodruff keys and Phosphor Bronze Bushes with Collars, which make the bearings self-oiling and practically free from wear. Heavy tin is used in the construction of the Cylinders which are carefully balanced and thoroughly tested.

CATALOGUE
OF
PICKING MACHINERY,
REV. FLAT CARDS,
DRAWING FRAMES,
SLUBBING, INTERMEDIATE, ROVING and JACK FRAMES,
SPINNING FRAMES,
TWISTERS.

COTTON MACHINERY

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TEXTILE WORLD RECORD

AUGUST, 1911

Monthly Comment.

The Tariff Situation

Events have moved rapidly in tariff legislation since our July issue appeared. First came the passage of the Canadian reciprocity act by the Senate and its approval by the President. All but one of its provisions await action by Canada before going into effect. The one exception was the paragraph relating to wood pulp and print paper, which goes into effect without waiting for action by Canada. After passing the reciprocity bill the Senate took up the Underwood bill for the revision of schedule K, and by unanimous consent the voting on the amendments and on the bill itself was fixed for July 27. On that date without debate the Senate first voted down, by 66 to 16, the substitute offered by Senator La Follette, which was in substance as follows:

	Per cent Ad Valorem
Clothing and worsted wools	40
Carpet wool	10
By-products, shoddy, etc.	30
Worsted tops	45
Yarns	50
Cloths and knit goods	60
Carpets	40

The Underwood bill was then reported to the Senate and defeated by a vote of 44 nays to 36 yeas, the insurgent Republicans voting with the regulars against the bill. On motion of Senator La Follette the Senate voted, 49 to 31, to reconsider the vote by which the bill had been defeated, and then Senator La Follette offered a new substitute which provided for the following rates:

	Per cent Ad Valorem
Clothing and worsted wools	35
Carpet wool	10
Worsted waste	30
Noils, shoddy, rags and wool waste	25
Worsted tops	40
Yarns	45
Cloths and knit goods	55
Carpets	35

This second substitute offered by Senator La Follette passed the Senate by a vote of 48 to 32, the insurgent Republicans joining forces this time with the Democrats.

Following the passage of the La Follette substitute came action on the free list bill on Aug. 1, the Senate passing this measure by a vote of 48 to 30. On the same day the House of Representatives voted not to concur in the La Follette substitute for the Underwood bill for revising schedule K, and asked for a conference.

Such is the situation as we go to press, and by the time this issue appears the measures agreed upon by the two branches of Congress will probably be known to our readers.

Army Goods.

About a year and a half ago it occurred to us that information regarding the construction and market price of goods used for uniforms in foreign armies would be of value to manufacturers in this country. Accordingly we wrote to Major Carson, then chief of the Bureau of Manufacturers, asking him to secure samples of foreign army goods and full

particulars regarding specifications and prices. Major Carson consented without hesitation to make the investigation and as a result the American embassies and consular agents in Europe proceeded to collect the required samples and information. The foreign departments of several of the Euorpean governments lent their aid and in the course of time a large number of samples of army goods and reports upon them were sent to the Bureau of Manufactures at Washington and then forwarded to this office. The Chief of the Bureau consented to our retaining parts of the samples and as a result we have at our Boston office a valuable collection representing the fabrics used by European governments for army uniforms. We also have detailed specifications for a large number of the samples, and prices at which they have been sold to the respective governments. The collection of samples and the specifications are of special value to carded woolen manufacturers at the present time, when the Government is engaged in changing the construction of the fabrics which have heretofore been used for army uniforms. Any manufacturers desiring to examine these foreign goods can do so by calling at this office.

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Short Time in Lancashire.

The general committee of the Cotton Spinners Federation in Lancashire issued last month an appeal to those spinners using American cotton to stop their mills on Saturday of each week until the end of September. This policy was urged because of the high price of cotton and the failure of yarn to advance so as to afford the spinning trade a fair profit. A ballot was taken on the question with the result that the assent of the necessary 80 per cent. of the mills to the short time project was not obtained. As a result the Lancashire spinners are left free to operate their mills in accordance with their own individual necessities. Thus once more has it been demonstrated that short time in cotton mills depends not so much on organization for that object, as upon the immediate necessities of the trade. Doubtless if the depression in the cotton spinning trade increases the necessary prcentage to enforce short time will be obtained. The important point to be noted, however, is that this result can be brought about only by business depression and not by preliminary organization.

—÷—

The Baling of Wool

A conference attended by over one hundred French and foreign delegates was held last month at Roubaix to consider ways and means for improving the baling of wool and preventing vegetable fibers from becoming mixed with the wool. A report by the international committee on vegetable fibers which was read at this meeting, recommended that paper be placed between the wool and the canvas covering, especially in packing washed wool and fine merinos. The report also contained the recommendation that the outer canvas covering be tight, strong and of good material. A report by a committee representing the Union of French Spinners was read, the following being the published abstract:

It stated that the damage arising from the hemp or jute of packing cloth is the most treacherous to which a wool consumer is exposed. This vegetable matter has the color of the wool, with which it becomes mixed. It is then almost impossible to recognize it, or to detect it among combed wool. Dyeing also often gives these intruding fibres the same appearance as wool; but the dye on jute and hemp is quite superficial, and disappears in the process of fulling. Thereupon the evil becomes apparent—when it is almost irremediable. In fact, in the processes of combing, spinning, and weaving, these vegetable threads are torn and broken, and they are mixed thoroughly with the wool, entangled among its fibres until it becomes impossible to separate them out. The desires of spinners might be summed up as follows:—

(1) By the cultivator, the disuse of vegetable twine; packing in a tissue of paper, or at least in canvas lined with paper.

(2) In transport, avoidance of the use of hooks.

(3) In combing (granted that the grower has avoided the use of vegetable twine and amended his packing) serious surveillance of all that can lead to or allow of the presence of vegetable fibres in the wool.

(4) In the packing of the combed wool, quality of canvas proportional to weight of bale; bobbins of combed wool wrapped in two leaves of paper privided with holes; bales pressed in the press;

bales supplied with loops, and not exceeding 100 klios. (220 lbs.) in weight, in order to avoid the use of hooks.

The Congress adopted the following recommendations:—

(1) That the grower should do away with string for fleeces, or at least replace jute string by paper string.

(2) That raw wool should be packed in canvas bags lined with paper.

(3) That combed wool should be packed in paper.

(4) That the bales of combed wool should be pressed after conditioning.

(5) That the weight of bales of combed wool should not exceed 100 kilos., (220 lbs.) so as to avoid the use of hooks.

The Cultivation of Kapok

Owing to the high price and scarcity of cotton, German manufacturers are turning their attention to the cultivation of substitutes, among which is kapok. The German Committee on Colonial Agriculture has sent representatives to the Fiber Congress to be held in Surabaya, Java, to study the cultivation of sisal, manila, hemp, jute and kapok. Much is expected from the cultivation of kapok and calotropis, not only in the German colonies, but also in Mexico, Brazil and other South American states. The kapok crop for the current year is estimated at 70,000 bales. Herr Stark, of Chemnitz, has made careful experiments with a view of determining the possibilities of kapok, and it is stated that he has succeeded in bleaching it. It is also being mixed with wool and silk waste and spun into yarn by the carded woolen process. At the present time 25,000 pounds of kapok and calotropis per week is used in Germany. The Leipziger Monatschrift fuer Textil-Industrie states that the fiber from the West African rubber tree has been spun and woven into cloth and may prove an important substitute for cotton.

Bids for Carded Woolen Goods for the Army

The first bids for army goods under the new system which involved the change from worsted to carded woolen fabrics, and which left the bidder free to fix details of fabric construction to suit himself so long as the cloth met the requirements laid down by the War Department, were opened at Philadelphia on July 24. Bids were received from fifteen manufacturrs, as follows:

	Olive-drab woolen			
	Melton			Bedford cord
	50,000 yds.	75,000 yds.	175,000 yds.	50,000 yds.
Am. Woolen Co.	22-oz.	16-oz.	13-oz.	16-oz.
Sample 1	$1.63	$1.27	$1.08	....
" 2	1.55	1.18	1.02	....
" 3	1.58	1.18	1.02	....
" 4	1.36	1.04	.875	....
" 5	1.39	1.04	.875	....
Arthur D. Ellis				
10,000 yds.	1.40	1.185	....	....
15,000 "	1.425	....	....	....
25,000 "	....	1.225	....	....
25,000 "	1.45	....	....	....
Cal. Woolen Mills				
20,000 yds.	....	1.16	....	....
20,000 "	....	....	.95	....
Ricketts & Shaw				
15,000 yds.	1.3925	....	....	....
15,000 "	1.415	....	....	....
20,000 "	1.44	....	....	....
Knight W'l'n Mills				
25,000 yds.	1.498	....	1.079	....
50,000 "	....	1.183	....	....
Clinton W. Mfg. Co.				
50,000 yds.	1.51	1.20	....	....
100,000 "	....	....	1.00	....
25,000 "	....	....	....	$1.32
50,000 "	1.56	1.17	....	....
Worumbo M. Co.	2.00	1.625	....	....
J. Capps & Sons, Ltd.				
10,000 yds.	1.215	....	....	....
10,000 "	1.245	....	....	....
10,000 "	1.275	....	....	....
10,000 "	1.305	....	....	....
10,000 "	1.335	....	....	....
Germania Mills	1.447	1.1225	....	1.197
75,000 yds.	....	....	.9675	....
100,000 "	....	....	.99	....
50,000 "	....	....	....	1.10*
B. Y. Pippey	1.60	1.2725	1.0963	1.2725
James C. Peck	1.38	1.12	....	....
50,000 yds.	....	....	.98	....
Henry T. Kent				
5,000 yds.	1.37	1.15	....	....
5,000 "	1.43	....	....	....
20,000 "	1.52	....	1.04	....
20,000 "	1.47	....	1.02	....
10,000 "	....	1.17	.97	....
10,000 "	....	1.20	....	....
25,000 "	....	1.22	1.05	....
25,000 "	....	1.24	1.09	....
25,000 "	....	....	1.12	....
25,000 "	....	....	1.14	....
25,000 "	....	....	1.00	....
Waterloo Mfg. Co.	....	....	....	1.45
50,000 yds.	1.75	1.40	....	....
H. & W. H. Lewis				
10,000 yds.	1.747	....	....	....
15,000 "	....	1.383	....	....
35,000 "	....	....	1.177	....
20,000 "	1.583	....	....	....
30,000 "	....	1.286	....	....
70,000 "	....	....	1.083	....
Parker, Wilder & Co.	....	....	1.10	....

*16-oz. diagonal elastic.

These bids covered about 350,000 yards of cloth and they apparently met the expectations of the War Department that a broader completion would prevail in the bidding for carded woolen goods than had been previously obtained on bids for worsted goods. The samples submitted by the bidders are now being tested by the Quartermaster General to determine whether they meet the specified requirements. After these tests are completed the contracts will be awarded.

Cotton Bills of Lading

The question of foreign bills of lading for cotton, which has been the subject of prolonged negotiations, marked by frequent deadlocks, recently reached a stage where the domestic and foreign interests agreed upon a plan, which, it is believed, will correct the abuses of the old system, or rather lack of system. The details of the plan are stated in the following circular issued from Liverpool by H. Kern, chairman of the Cotton Bills of Lading Conference Committee:

On behalf of the Liverpool Bill of Lading Conference (1907) Committee, I have pleasure in announcing that after prolonged negotiations an understanding has been reached with the majority of the American railroads, which constitutes a great step in advance in the safeguarding of through bills of lading. A letter jointly addressed to my Committee and to the Bill of Lading Committee of the American Bankers' Association has been actually signed by over forty railroads, and it is confidently expected that all railroads will ultimately sign it, as practically all the important lines have already signified their approval of the scheme. Under the new arrangement, which comes into force on the 1st September, through bills of lading will be headed—"Through bill of lading issued under agreement with the Liverpool Bill of Lading Conference (1907) Committee and the American Bankers' Association."

The bills of lading will be numbered consecutively, beginning with number 1 at each issuing station on the 1st September of each year. They will be signed by the companies' authorized agent or representative who will sign in his own name. Only one original bill of lading and at least four copies will be issued—three of these copies bearing the same autograph signature as the original and all being stamped "Copy—not negotiable,"—both the original and two copies will be certified in the manner generally known as the valedation signature certificate scheme. The signature certificates will be uniform in size, and it is hoped that all railroads will be persuaded to use a form printed by the American Banknote Company on special paper with a safety device which makes erasures or treatment by chemicals at once discoverable. Of the two certified copies, one will be sent to the accounting department of the issuing railroad, and the other to a central bureau which will be established in New York, while two uncertified copies will be sent to the agent or representative of the ocean carrier to the central bureau, which will forissued in triplicate, one marked "Railroad's copy—not negotiable," which is to be retained by the railroad, one marked "Central Bureau's copy—not negotiable," and one marked "Consignee's copy—not negotiable." The latter two will be sent by the ocean carrier to the central bureau, whihc will forward the consignee's copy direct to the drawee in Europe, whose name will be furnished by the shipper on a printed form of letter. The exchange buyers are expected to make inquiries at the central bureau about each bill of lading that passes through their hands, and the central bureau will, as a further check, make weekly returns of all bills of lading received to the accounting departments of the issuing railroads.

My Committee will publish the full text of the letter of agreement shortly, together with further particulars regarding the working of the scheme and other details. Meanwhile it is safe to state that under the arrangement forgery will become a very remote contingency, as a conspiracy of three people (viz. the shipper, the railroad agent, and the certifying agent) will be required for the issuance of a bill of lading and signature certificate which could be taken as genuine, and even then a quicker detection of the fraud is certain to follow. My Committee therefore confidently relies upon receiving the active support of all interested parties in the proper carrying out of the scheme.

The Revision of the Cotton Schedule.

The work of opposing the revision of the cotton schedule devolved on the American Cotton Manufacturers Association and as a result that organization has issued three noteworthy pamphlets in which the official correspondence with Chairman Underwood is given together with a mass of valuable statistics bearing on the cotton trade. Bulletin No. 1 contains a copy of the Payne cotton schedule, and a statement of the imports of cotton goods for a series of years. Bulletin No. 2 contains a letter addressed to Chairman Underwood and signed by the committees of the Arkwright Club, the American Cotton Manufacturers Association and the National Association of Cotton Manufacturers. This bulletin also contains statistics bearing on the tariff question and information regarding various Southern cotton manufacturing corporations. In addition there are the committee reports on the Mills, McKinley, Wilson, Dingley and Payne-Aldrich

bills. The third bulletin gives additional correspondence between R. M. Miller, Jr., chairman of the cotton manufacturers committee, and Chairman Underwood. The following letter dated July 18th from Mr. Miller to Mr. Underwood outlines the position taken by the manufacturers

Charlotte, N. C., July 18, 1911.

Mr. O. W. Underwood, Chairman,
Committee on Ways and Means,
House of Representatives,
Washington, D. C.

Sir: As instructed by the Tariff Committee of the American Cotton Manufacturers Association, which met here in Charlotte today, I have the honor to reply further to your favor of the 6th inst., stating our position on proposed legislation relating to Schedule 1, Cotton Manufactures, as follows:

(1) We are opposed to any revision that will increase the percentage of importation to total U. S. Cotton Manufactures that now exists.

In figuring percentages of importations to manufactures we call attention to the fact that importations under the Cotton Manufactures schedule were 17¼ per cent. of the total cotton manufacturers for the year 1910, including laces and other such luxuries that are not as yet made in great quantity in this country, although it is interesting to note that the manufacture of laces in the United States increased in value from three and one-half millions in 1900 to nearly ten millions in 1910.

We believe that any way it may be considered, that the present importations are sufficient to protect the consumer by regulating prices, for there is no monopoly or restraint of trade, but on the contrary, the keenest competition among cotton manufacturers of the United States.

We do not believe that anything more regulative of prices can be secured, however much importations may be increased, for American manufacturers are already down to cost, and without radical cutting of wages which is not believed could or should be effected, the chief result of legislating more foreign goods into this country would be only to transfer that work to foreigners, for the importers do not usually undersell a local market except enough to bring in their goods.

We believe that the cotton schedule bears its share of the customs revenue for the support of the government, and that there is no call for increasing the amount collected under it.

(2) We are opposed to revision without adequate data.

(3) We offer our assistance in obtaining such data.

(4) We are in favor of such revision as will protect all classifications under the schedule primarily in proportion to their labor costs, and are especially in favor of simplification of the schedule.

(5) We are opposed to any revision that does not take into account differences in other conditions as well as labor costs, particularly on account of Southern mill conditions.

(6) We are opposed to reductions of duty on machinery and other items entering into the cost of mills except such as will keep them on a parity with our own industry as to labor and other costs at home and abroad. We do not want our property depreciated, nor do we want broadly to injure other industries to help our own. Let each case rest on its merits and benefit equally.

(7) We are opposed to personal hearings; too often it has been alleged that unfair advantage has been taken that way in making the tariffs of the past.

(8) We are in favor of publicity and record, and of the freest and most open discussion and consideration of everything relating to tariff making.

(9) We demand that the data upon which revision is based be made public and a matter of record except with such concealment of names that good faith dictates with those furnishing data. If publicity is good for other things, and we believe it is, it certainly is desirable in such a vitally important matter as the tariff.

We also demand a definite statement as to just what it is intended by its makers that the revision shall accomplish:

(a) What measure of protection is it intended to afford to American cotton manufacturers, equality in labor cost only, equality in cost of production, or what?

(b) How much relative increase or decrease is intended in importations, which means much more or less competition is it intended to impose upon us?

(c) If more competition, how are we expected to meet it?

(d) If we are expected to cut labor, how is that labor to be compensated for the reduction and what can it definitely expect in lesser cost of living to offset the cut?

(e) What amount of revenue is the new tariff on cotton manufactures expected to yield?

(f) What reduction is expected, if any, in the cost of articles of cotton manufacture to the consumer at retail stores?

We ask consideration of the above in the spirit in which it is offered.

We intend no reflection; we merely ask to have our way pointed out by those who make the way.

We beg to have it borne in mind that our industry directly concerns two millions of people, and indirectly many more; that we are not simply manufacturers and employees asking protection for our property and our labor, but that we are consumers and that we are citizens most of whom voted for the party proposing this revision and who expected not only that any revisions would be made with as much prudence as would be exercised in private business matters, but also that they would be conducted with all the publicity that was generally promised among other reforms.

We beg to remain,

Respectfully yours,
R. M. Miller, Jr., Chr.

The production of cotton in Russia in 1910 amounted to 900,000 bales of 500 pounds each.

COL. ALBERT CLARKE

The death of Col. Albert Clarke occurred on July 16 at Highgate, Vt., from the effects of a stroke of paralysis sustained while he was in attendance at a reunion of his regiment. Born at Granville, Vt., on Oct. 13, 1840, he was brought up on a farm and educated in the public schools. He was admitted to the bar in 1861, but his practice was interrupted by the outbreak of the civil war. He enlisted as a private in the 13th Vermont regiment in August, 1862, fought in many battles, was promoted to a lieutenancy, and commanded his company at Gettysburg. At the close of his service Col. Clarke returned to his native state, and was appointed on Gov. Dillingham's staff. He served four years as clerk of the Vermont House of Representatives and in 1869 became proprietor of the St. Albans Daily Messenger. Col. Clarke was elected to the Vermont Senate in 1874, was president of the Vermont and Canada Railroad Company, and took active part in the political controversy over the railroad question at that time, advocating the abolition of passes and the State control of railroads. Col. Clarke came to Boston in 1880, where he was connected with the Boston Advertiser from 1883 until 1885, when he became proprietor of the Rutland (Vt). Herald. In 1889 Col. Clarke was appointed secretary of the Home Market Club, a position which he retained to the time of his death. He served in the Massachusetts House of Representatives in 1896, 1897 and 1898, being a member of the Ways and Means Committee. Col. Clarke was a delegate to the National Republican Convention in 1892, and in 1899 was appointed a member of the National Industrial Commission by President McKinley. This commission consisted of five United States Senators, five Representatives, and nine appointees, of the President. Its reports and recommendations filled more than 17,000 closely printed pages and are held in high estimation for reference. Col. Clarke took an active part in G. A. R. work. He was commander of the post at St. Albans and vice-commander of the Department of Vermont. He served as judge advocate general of the Department of Massachusetts and was a member of the Massachusetts Commandery of the Loyal Legion.

Col. Clarke is best known as the secretary of the Home Market Club, and the able and unwavering defender of protection to American industries. He had a wide acquaintance with public men and all who knew him had confidence in his sincerity. It was the good fortune of the editor of this magazine to become well acquainted with Col. Clarke, and to know him, not only as a public man, but as a friend. We can testify to his ability, his high character and the bravery and fortitude with which he faced the trials of this world.

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THE FALL MEETING OF THE NATIONAL ASSOCIATION OF COTTON MANUFACTURERS.

The board of government of the National Association of Cotton Manufacturers has decided to hold the 91st meeting of that organization at Hotel Equinox, Manchester, Vt., beginning on the evening of September 27 and continuing for the two following days.

This hotel is situated in a district of rare scenic beauty and its golf course is claimed to be among the best in this country.

The first evening will be devoted to the president's address by Franklin W. Hobbs, Brookline, Mass., and also an address of welcome by Governor John H. Mead, of Vermont, to be followed by an informal reception by the president, which will afford an opportunity for the renewal of acquaintances and the formation of new ones; and sessions for the presentation of papers will be held during the forenoons and evenings of the following days.

It is also expected that Hon. James Wilson, Secretary of Agriculture, and Hon. John W. Weeks, member of Congress, and also an honorary member of the association, will address the meeting at some of its sessions.

Arrangements have been made for a number of papers, but the association is desiring more of them from the members.

Later information will be given in regard to the programmes and also other traveling arrangements and excursion rates for the benefit of the members.

Australian Methods of Conducting the Wool Trade.

By BOBBIN.

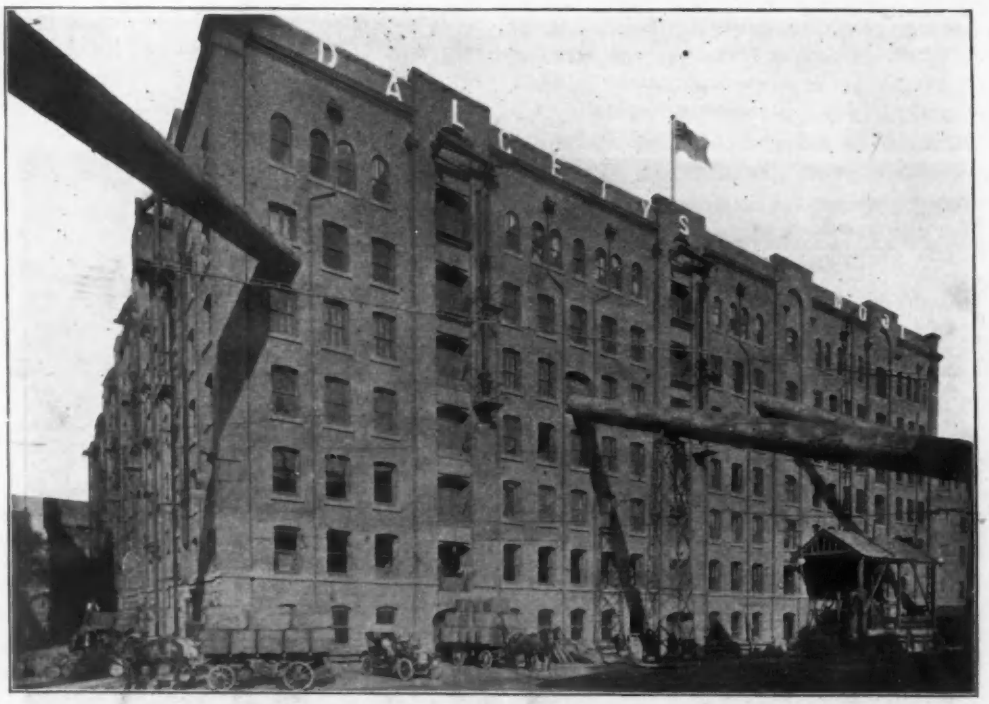
In order to give an idea of the Australian Wool Trade and the manner in which it is conducted, it will be necessary to consider the subject from the time the sheep are driven from the paddock to the shearing shed until the wool is shipped to the port of destination. Shearing generally begins about the month of August, while in the warmer districts a start is very often made as early as April or May. Stations in Australia vary in size from, 50 acres to 50,000 acres and even larger, carrying from 50 to 100,000 sheep, but it is considered very profitable country that will carry 1 sheep to the acre. A station carrying 30,000 sheep would require a shed filled up with shearing machines to accommodate 16 shearers. Arrangements are then made with the shearers to commence operations on a given date and with everything in readiness a start is made, the roll being called to ensure that the required number of men are present. The following would be the full complement of hands required for the undertaking: 16 shearers, 2 pressers, 1 engine driver, 1 overseer and bookkeeper, 4 wool rollers, 3 piece pickers, 3 pickers-up, and 1 sweeper.

While shearing is in progress the 3 pickers-up follow along the line of shearers and gather the fleeces as they are removed from the sheeps' back and return them to the tables to be classed and sorted into the various qualities. The object of classing at the wool table, at the shearing shed, and of sorting and picking over the pieces, bellies, locks, etc., is to grade the wool in such a manner that every bale of a quality shall be an exact replica of its neighbor; in other words, that the classing shall be evenly done, and that every bale shall contain exactly the same quality in every part of it. With this gang of shearers working full time the shed will "cut out" that is, complete operations, in about four weeks. They will them move to the next station and so on until the entire clip is removed from the sheep's back.

CLASSING, BALING AND BRANDING FOR THE MARKET.

After the wool has been sorted and put into bales it is pressed and branded with the

owner's recognized brand, the description of the contents and the number being legibly marked in black or blue as the case may be. It is then taken from the sheds in drays drawn by either horses or bullocks to the nearest railway station en route to market, where it is received into commodious stores, being weighed within 48 hours of its arrival.



A MODERN STORE HOUSE AT SIDNEY, SHOWING THE TUBES THROUGH WHICH THE BALES SLIDE FROM THE FLOOR TO THE SHIP'S HOLD.

A separate stack for each description has to be made and space for same kept till the whole parcel comes to hand. It is upon these weights which are termed "in weights" that the wool is sold. To facilitate business wool is always weighed as it comes into the store, in fact, in the wool season it would be impossible to get through the work if every bale in the catalogue of say 6000 or 7000 bales had to be weighed after the sale. Invoicing and delivery would be delayed and a lot of double handling entailed. At the same time it is only fair that the buyer should have the right of weighing if he has reason to doubt that bales are not as heavy as invoiced. In the event of bales being lighter the broker would, of course, have to make the necessary allowance, as he guarantees that the weight of wool shall be equal to the invoice. It is very seldom, however, that a request is made for wool to be weighed, which may be taken as a tribute to the general correctness with which wool is originally weighed.

The average instructions given by the grower or owner of the wool to his broker would be somewhat as follows: "I am sending you my clip of wool, and, as you will see by the enclosed particulars, I have had same carefully classed. I wish you, on its arrival to fully examine each description and place it in your catalogue in a way that will produce the best results for me. On receipt of your valuations I will forward you instructions, etc." After valuations have been sent

instructions are given and it appears in the catalogue in the following way:

JK	NEW ENGLAND	1st com.	19 bales
	"	2nd com.	23 "
	"	clothing	14 "
	"	pieces	7 "
	"	locks	4 "
	"	calico	5 "
	"	lamb	6 "

tum is to get a soft, uniform light admitted in such a manner that no shadow is thrown on the wool. This, a properly constructed "saw tooth" roof does.

In the old days prior to the eighties wool was shown in whatever part of the store it happened to be stacked and all that was to be done was to affix a lot number to each stack and make incisions in the bales from which buyers drew samples of the bales. The sample so drawn had then to be taken to the nearest window for examination, as the light, especially in the middle of some of the floors was not good enough to value by.

STACKING WOOL IN A STORE ROOM.

Fair sample bales of each description have to be taken from the stack. With small lots every bale has to be shown. These bales are sent to the sample floor, caps of the bales removed and the wool thoroughly opened out for buyers' inspection on floors specially constructed for that purpose. What is considered as a "properly lighted floor" is one which, besides having windows level, or nearly so, with the floor, has a roof made on the "saw tooth" principle by which light is admitted every 15 feet or so from above.

In valuing wool the great desidera-

The previous explanation regarding the more enlightened (in more senses than one) and up-to-date character of present methods shows what a change has been made in this department of the business, but it must be remembered that the new system of showing wool, while of greatly increased benefit to both growers and buyers meant greatly increased cost to the brokers, not only in labor, but in transforming his store and partially rebuilding it in order to provide the improved roof demanded by the rapid devlopment and advancement of the trade.

The wool remains on view from 6 o'clock on the morning of sale till 3 in the afternoon, but the valuing by buyers is generally completed by 2 o'clock. Then at 3 o'clock punctually the first auctioneer on the roster (for there are always 2 or 3 firms selling on the same day) enters the rostrum and commences operations, having in front of him an audience representative of almost every wool manufacturing center in the world. Conspicuous amongst this audience are buyers on Japanese account. A few years ago there was one, today there are about a dozen Japanese.

WEIGHING WOOL ON ARRIVAL AT STORE HOUSE.

After the sale has been gone through all the sample bales on the show floors have to be sewn up, repacked, etc., and put into shipping order for delivery to the buyer. The sample bales then returned to the stack and there may have been from 10 to 15 different buyers who have made purchases from this particular clip of wool. The buyer may apply for delivery the day after sale, perhaps ten days and in some cases two or three months after, but the broker must always be ready at very short notice to give delivery when asked for. The buyer, perhaps does not pay for the wool until he takes delivery but the owner receives his returns within 7 days of the sale so that a large amount of capital is necessary for the proper conduct of the business. If this capital were not awaitable and ample time given to buyers to complete their shipping arrangements, the wool grower would not receive the benefit of all the competition that he should get for his wool. Perhaps the grower may not be satisfied with the valuations sent and may prefer to hold his wool for a better market. If he elects to do this, brokers willingly give him free storage as long as desired. To carry out all the details a special staff of experts in the various branches has, as a necessity to be kept, otherwise the owner would find that his instructions were not followed, that his wool was improperly shown, and that all trouble and expense he had gone to in having his clip properly got up for market had been thrown away through the inexperience of want of attention. The Australian

wool market has attained its present high position through continuous efforts on the part of those thoroughly conversant with the details of the business, who have from time to time promptly adopted any suggestion, whether coming from within or without their own circle which had for its aim the improvement and benefit of the trade.

A roster of sales is framed yearly which gives each broker one sale every 6 days, giving him ample time to square up and prepare for the next. The sales are held from Monday to Thursday inclusive every week from the middle of September to the end of March and in order to regulate supplies there is a restriction on the number of lots offered each day. On the night of sale a telegram or letter, perhaps both, are sent off to the

A SHOW FLOOR WITH BALES OPENED FOR BUYER'S INSPECTION.

DUMPING, READY FOR SHIPMENT.

owner, advising the result of sale, state of the market, etc. A printed priced catalogue giving particulars of every lot in the catalogue with each price realized is posted the following day at latest to every grower who has wool included. The next communication received by the grower a week after gives the account of sales and checque for proceeds.

be properly handled in the time avilable, especially as the work is exacting and exhausting, being carried on during the hottest months of the year and on top floors, where the construction of the roofs makes the heat felt to the fullest extent.

No sales of wool are made either at auction or privately at any fraction of a penny other than the following, viz., 1/4d, 1/2d,

STOWING WOOL IN HOLD OF OVERSEA STEAMER.

It may be said that the time available for valuing the catalogues is practically deduced to 6 or 7 hours and it is for this reason that some limit must be placed on the number of lots to be offered in one day. Apart from the limited time avilable the physical capacity of buyers has to be taken into consideration, as they have only the morning of sale day in which to work. The limits of lots is placed at 3,112 large lots (5 bales and over) and 4,500 small lots (4 bales and under) per 5 selling days which would amount to about 600 large and 900 small lots per day. It has been found that the above is as much as can

3/4d. This is tantamount to saying that bids shall proceed by not less than farthings and is intended to do away with such mixed prices as, say, 7 3/8d or 8 9/16d., etc.

Having inspected and passed his purchases, the buyer instructs the broker to send down the wool to the wharf at which the vessel selected to convey it to the other side of the world may be lying, the cost of cartage from store to wharf being borne by the selling broker. At the wharf it is taken in charge by the stevedore, who, unless the wool is to be shipped undumped (which is rarely the case), reduces each bale by hy-

draulic pressure and generally, three iron bands, to half its original compass. Finally, the bales are packed in the hold of the vessel, further mechanical pressure being employed to jam them into the smallest possible compass, with a view, of course, to the economy of space, and without any consideration for what the appearance of the bales or their contents will be on arrival in London, the Continent, America, or Japan, or wherever the port of destination may be.

THE FINE COTTON SPINNERS' AND DOUBLERS' ASSOCIATION

BY WESSEX

This company, which has recently purchased a cotton plantation in Mississippi, was one of the promotion in 1898 of the late Scott Lings who arranged the combinations of Calico Printers, Bleachers, Bradford Dyers, Woolcombers, English Sewing Cotton, Slubbing Dyers, etc. It was founded (to quote its prospectus) "to amalgamate into one concern 31 companies and firms engaged in spinning (Sea Island) cotton, or in doubling yarns from this and other staples of cotton." The prospectus described the business done as "steady and nonspeculative and a kind of monopoly" and referred to the "extreme difficulty of inducing consumers of fine yarns to accept the risk of using new or unknown marks in the manufacture of expensive fabrcs, which renders an established connection indispensable. This fact adds to the value of long established business and places an obstacle in the way of new competitors."

The good will of the businesses bought was reckoned on a basis of three years' profits and dividends of 8 1/2 per cent. were promised.

Dividends have been, on common stock:

99	00	01	02	03	04	05	06	07	08	09	10
8	8	9	8	8	8	4	6	10	12	8	8

Eight per cent is the normal and the directors purpose to pay 8 regularly. The average profits of 100 Oldham limited companies (spinners of American staple) in 24 years prior to 1908 was 4.8 per cent. of share capital.

In its first year the Fine Spurs bought 6 additional establishments, in the second year 5 more and acquired control of a competing French concern and by the end of 1905 consisted of 47 associated spinning companies besides a colliery, Delebart freres (France), Carber Bros. (Manchester and Alexandria cotton brokers and merchants) and some smaller concerns. It had nine months ago 3 1/2 million spindles and doubtless has more than that total now, although in the interests of economy a few small mills have been closed or transferred at different times. An important element in the strength of the company is its ability to take large contracts.

The following list of works is not exhaustive, but has been compiled from such sources as are accessible at the moment and gives some idea of the character of the business:

Balfe & Co., Ltd., West Gorton, Manchester (doublers).
Baxley Bros., Ltd., E. Ancoats, Manchester (doublers and spinners), 47,000 spindles, 100/250s single and 2 ply.
C. E. Bennett & Co., Ltd., Manchester, England (doublers, super lace yarns, etc.).
Bolton Spinning & Doubling Co., Bolton, England, 13,000 spindles, 40/200s.
Brown & Fallows, Bolton, England (curtain and velvet yarn), 30,000 spindles, 50/250s.
J. H. Brown, Manchester (doubler).
Gorsey Bank Doubling Co., Stockport (doublers), 12,000 spindles, 20/200s
W. Holland & Sons, Ltd., Miles Platting (spinners), 170,000 spindles, 40/200s.
T. Houldsworth & Co., Ltd., Reddish, 140,000 spindles, 40/300s.
H. W. Lee & Co., Ltd., Salford, 30,000 spindles, 40/200s.
McConnel & Co., Ltd., Manchester (doublers and spinners), 155,000 spindles, 40/200s and up.
R. Marsland & Co., Ltd., Manchester (spinners), 45,000 spindles 140/240s, 75,000 spindles 70/135s.
S. Moorhouse, Ltd., Stockport (ring doublers, etc.), 43,000 spindles.
Ormrod Hardcastle & Co., Ltd., Bolton, 137,000 spindles, 37,000 doublers, 80/200s.
T. Rivett, Ltd., Stockport (doublers, gassed yarns), 50/150s.
John Rostron, Ltd., Bolton (doubler), 23,000 spindles, 40/220s.
Shaw, Jardine & Co., Ltd., Manchester (spinners), 200,000 spindles, 60/200s.
T. Taylor & Sons, Ltd., Bolton (sewings, healds, crochets, etc.), 105,000 spindles, 4/200s.
J. Bellhouse & Wainwright, Ltd., Manchester (spinners), 80,000 spindles, 100/350s.
F. W. Bouth & Co., Ltd., Leigh, 58,000 spindles, 80/140s.

Jackson-Staut Spinning Co., Manchester (spinners), 87,000 spindles.
Jonn Knott & Sons, Ltd., Ashton, 38,000 spindles, 40/140s.
A. & G. Murray, Ltd., Manchester (spinners), 100,000 spindles, 100/300s.
Musgrove Spinning Co., Ltd., Bolton (spinners), 400,000 spindles, 10/200s.
Reddish Spinning Co., Ltd., Reddish (spinners), 121,000 spindles, 40/200s.
Wolfenden & Son, Ltd., Bolton, 90,000 spindles, 20/180s.
C. Wright & Co., Ltd., Tyldesley, 220,000 spindles, 40/180s.

Some of the mills spin only and some double only. It is understood that little work below 80s is spun by the Association. Although very elaborate and exact returns are drawn up for use of the management these are not published.

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EFFICIENCY OR SCIENTIFIC MANAGEMENT

BY EUGENE SZEPESI

(Copyrighted.)

(Continued from July.)

The opportunities today for cotton waste manufacturing are almost unlimited. It would not be a venture of questionable success. We have examples before us of how a big industry has been built up in Germany and England from cotton waste, bringing returns which make the industry one of the most desirable. A great objection toward articles manufactured of cotton waste has been that it has a disagreeable odor and is unsanitary. This objection is today overcome, as when the waste is dyed, bleached or handled with a disinfectant solution, cotton waste is no more unsanitary than a shoddy which goes through the manufacturing process. German cotton waste is also used for apparel fabric, having a finish like a woolen fabric. This article could not be considered for the American market as we are the best dressed nation in the world and there is no necessity for the introduction of such articles.

As to the machinery required for spinning cotton waste, the woolen system has been adopted. The process of manufacturing is a simple one and is considerably shorter than the ordinary cotton manufacture. The machines are made by several manufacturers, which may differ in details, but are identical in construction. Usually cotton waste is assorted as to the grade, and thread waste is put through the tearing or popularly known garnetting machine. This machine is built with from one to nine drums, according to the material to be opened. The operation consists of exposing the threads to the action of lags, which open the thread and free the fibers. For regular filling waste up to No. 36 a garnetting machine with five drums is adopted. For slasher waste or sized waste a machine with from five to seven drums is desirable. A good garnetting machine never tears the fiber, but opens the thread gradually, the delivered product being a soft wadding. The production of such a machine is very large. A well constructed machine with five drums will produce about 1,200 lbs., working ten hours, of No. 30 yarn.

Sweepings and mote waste is generally cleaned in an ordinary drum cleaner and run through a Creighton opener which opens the matted fibers just like ordinary cotton. The Creighton openers are very often built with a scutcher or beater combination. The different grades of waste are generally mixed according to the number to be spun. Low grade waste, such as motes, oily sweepings, and card sweeps are seldom spun over No. 4. High grade waste, such as weft cups, sliver and self-actor waste, is spun sometimes as high as No. 10. The mixing of the different grades is done on a machine known as the Wolf, which has a carding arrangement with heavy clothing and which machine has proven to be satisfactory not only in mixing the different grades, but also for cleaning the fibers of the impurities which escape the action of the opener and scutcher. The carding wolf or willey delivers the material in the bulk, which is transmitted to the carding engines. This process for low grade yarns up to No. 4 is omitted. The carding is done on the so called two set cards with the siugle doffer system. The material is dumped into the automatic feeder which delivers the material in even quantity into the first card, which is generally built

with a set of lidkerin rollers and six sets of worker and stripper rollers over the main drum. The theory of waste carding is absolutely identical with wool carding. The lap is divided through the actions of rubbing aprons into slivers which are wound on a roller and are ready for the spinning process. The production of a card set varies as to the number produced. For No. 1 yarn, for instance, a set will produce about 900 lbs. in ten hours. For No. 8 the production is about 450 lbs. The next process is the spinning.

For spinning waste yarns several systems have been adopted. Many manufacturers use even today the so called flyer system, but this method is today out of date and is not efficient. The cup system is very advisable for numbers not higher than No. 4. Cup spinning is done in the following way. The sliver is placed in a circular disk which has a cover and an outlet for the sliver. This disk will revolve and give the yarn the necessary twist. The twisted yarn is wound on an ordinary shuttle bobbin, according to the cup quilling method, which is familiar to us all. This has an advantage, as coarse yarn of that kind is frequently used as a filling in wiping cloths and cheap carpets and an operation is saved through this method. The production of these machines is quite high. The average production of one spindle is about 11 lbs.

A certain French concern attempted a few years ago to build a ring spinning machine suitable for waste yarns. This system consisted of a series of drawing rollers similar to the regular ring spinning machine, but instead of being placed in a frame horizontally the rollers were placed at an angle of about 30°. The last top roll was provided with a nozzle which gave the yarn an extra draft to equalize the unevenness caused by the short draft. Today this system is in deed of many improvements and therefore its practicability is questioned by the millmen. The most advisable and in fact the only satisfactory method of spinning waste yarns higher than No. 4 is the self-actor system. This self-actor is identical with the woolen self-actor and therefore the description of same is not necessary.

This is the general outline of cotton waste spinning. My opinion is that the proper utilization of cotton waste by the American cotton manufacturers would be beneficial to both the producer and the consumer. The manufacturer would obtain a higher figure for his waste, for which reason he would handle it himself more economically. The great population again would enjoy the benefits of cheap and serviceable articles which would be within the means of the poorest. The present question is only a certain "modus vivendi" (how to do it). Certain large cotton manufacturers in the New England States are on the right road. They have established several cotton waste utilization concerns which no doubt will prove successful in obtaining a better price for waste.

For the Southern manufacturers an organization of this kind, but more intensive, would be the right thing. They have the cotton waste; they have the market within their own limits, and it would only be a matter of cooperation to realize a desirable profit from their waste products. The number of articles which could be manufactured from the waste are numerous. The field is almost unlimited and sooner or later it will be realized that the field is large enough to assure a success of such an undertaking. I say it; sooner or later, so why not sooner?

A COURSE IN MILL ACCOUNTING

The North Carolina Textile School at Raleigh, N. C., has added a mill accounting course to the courses already established. This course will be in charge of John E. Halsted, who is a practical mill accountant. Such a course cannot fail to be of great value to the textile trade owing to the the present lack of uniformity and system in the keeping of mill accounts.

Census returns show that the 15 linen establishments in the United States in 1905 employed 1,260 men who received $621,135 in wages, 1,990 women who were paid $582,392, and 561 children who received $121,094.

THE NEW DUNEAN MILLS

The Dunean Mill, now under construction at Greenville, S. C., is of interest, from an electrical point of view, in the extent of the application of individual motors to textile machinery.

The mill is organized for the manufacture of fine cotton cloths from long staple cotton, and will have a capacity of 50,000 spindles and 1,200 looms. The mill buildings consist of a two-story main building for the preparatory and spinning processes, a single story weave shed with saw-tooth roof construction, separate cloth-room building, warehouses, boiler room and sub-station.

Power will be purchased from the Southern Power Company and will be three phase with a potential of approximately 12,000 volt and a frequency of 60 cycles. In the substation the voltage will be stepped down to 230 volts and, after passing through an automatic voltage regulator, distributed to the various feeder circuits.

The total number of motors installed will be approximately 1,600, with an aggregate rated capacity of 2,000 h. p. Individual motors will be used for driving the pickers, the spinning and twister frames, the spoolers and the looms. Cards and other preparatory machinery will be driven by motors of moderate size on the "group" system with shafting and belting.

The picker-room equipment will consist of eleven 7 1/2 h. p. 1,800 r. p. m. motors, mounted on an "A" frame above the pickers, and so arranged that the belt from motor to machine may be adjusted.

In the spinning room there will be installed two hundred spinning frames, each driven by a 5 h. p. 1,800 r. p. m. motor through a steel pinion and cloth gear. The twister frame equipment will be similar to the spinning frames except that 7 1/2 h. p. motors will be used, 12 of these motors being installed.

In the spooler room the warpers will be group driven from a 5 h. p. motor, the 10 spoolers being gear driven each by a 1/2 h. p. 1,800 r. p. m. motor.

In the weave shed there will be installed 1,200 fancy looms each driven by a 1/3 h. p. 1,800 r. p. m. motor through gearing.

All heavy wiring will be run in wire tunnels underground. In the buildings all wiring for power and lighting will be installed in rigid conduit. Mazda lamps with Holophane steel reflectors will be used for lighting all departments.

The contract for the entire equipment of electrical apparatus and supplies was awarded to the General Electric Company.

The opening and picking machinery will be installed by the Kitson Machine Co., the twisters by the Lowell Machine Shop, the cards, roving, spinning machinery and spoolers by the Saco-Pettee Co., and the looms by the Crompton & Knowles Loom Works.

The officers of the mill are: President, J. Adger Smyth, Jr.; Vice-President, Captain E. A. Smyth; Secretary, Claude D. Smith. T. B. Wallace will be superintendent.

The engineering of the mill is being done by J. E. Sirrine, mill architect engineer, Greenville, S. C.

MIDDLE STATES TEXTILE ASSOCIATION.

The annual meeting of the Middle States Textile Manufacturers' Association was held at French Lick Springs, Ky., on July 19th. The following board of governors was elected for the ensuing year: Paul J. Marrs, Henderson, Ky. president; Philip S. Tuley, Louisville, Ky. vice president; Lee Rodman, Cannellton, Ind., secretary and treasurer; Robert A. Cochran, Maysville, Ky.; E. S. Hobbs, Aurora, Ill.; James Maynard, Knoxville, Tenn.; Charles N. Brown, Evansville, Ind.

The method of purchasing cotton was discussed at this meeting and what is known as the Carolina mill rules were adopted. The tariff on cotton goods also came in for consideration and the following resolution was adopted:

First, the continued agitation of the tariff question is detrimental to the interests of all manufacturers and merchants of the Untied States; second, that Congress should appoint a special tariff commissoin and leave the adjustment of rates entirely in the hands of this commission.

The following resolution dealing with the method of reporting cotton quotation was also adopted:

First, the textile industry, both manufacturing and distributing, is being injured by the failure of the newspapers of the United States to make a proper distinction between quotation and fluctuation of spot cotton and the future quotations of the New York and New Orleans cotton exchanges in their headlines over market reports and in their news articles concerning active fluctuations; second, that the Associated Press and leading textile papers be requested to aid in securing more intelligent handling and headlining of news concerning cotton and future quotations by the newspapers of the country.

CHEAP WATER FOR INDUSTRIAL PURPOSES

By CHURCHILL HUNGERFORD, Filtration Engineer

(From a paper read before the Franklin Institute.)

It is frequently a matter of surprise to otherwise well informed persons that the ordinary standards of purity required in drinking water are sometimes not nearly as severe as those required in water used for industrial purposes. Nevertheless, this is true in many instances, because the water contains certain substances which are perfectly harmless to the human system but possess chemical affinities for other substances used in the arts and industries that create very annoying disturbances indeed. On the other hand, many waters that have been so highly contaminated by sewage and industrial wastes that no form of purification would make them suitable for drinking purposes, can be made eminently satisfactory for industrial purposes. It is a by no means uncommon condition to find a manufactory unable to use the city supply, which may be justly considered especially fine from a potable standpoint, yet by means of an efficient purification plant be able to get perfect satisfaction from a polluted stream which receives the sewage and industrial waste of the town itself.

Cheap water is imperative in the present day to the manufacturer. He cannot afford to pay from four to thirty-five cents per thousand gallons to the municipality for several million gallons of water per day and he is perforce driven to the polluted streams, his only alternative being to place his establishment at so remote a point that it becomes difficult of access and almost impossible to procure labor. Naturally he chooses the situation of his plant with reference to the availability of labor and the propinquity of the market. The vital question that then comes before him is, can the highly polluted water supply which is available be made suitable for his purposes? The answer to this question, in ninety-nine cases out of a hundred, is in the affirmative. It can be done and done well. Moreover, in large plants the average cost of treatment can be kept well below $3.50 per million gallons, or say one-third of one cent per thousand gallons as against the four to thirty-five cents per thousand the manufacturer would be compelled to pay to the municipality.

Such conditions as the last represent perhaps seventy-five per cent of the problems of industrial filtration at the present day and the percentage is continually increasing.

The problems involved in such waters, especialy when contaminated by many different substances, become complex in their nature. True the old stand-by sulphate of alumina, still figures very extensively in all such plants, but there are many conditions wherein the use of sulphate of alumina alone as a preliminary treatment leads to a downright failure of the filter plant to accomplish the desired aims. To reach perfect results an intimate knowledge of the nature of the contamination must be reached. Chemical analysis, of course, tells us much and a bacteriological analysis is also necessary in some cases but an actual survey of the conditions to be met must be made before an intelligent purification plant can be constructed.

We come to the operation of the plant itself. In the first place we wish to get rid of the already precipitated matter as economically and efficiently as possible. In the next place we must precipitate as cheaply as possible the remaining deleterious substances. As above stated the most economical and efficient substance for doing the major part of this work is sulphate of alumina. The writer realizes that there will be considerable protest made in favor of sulphate of iron and lime. Nevertheless so far as his own ex-

perience goes, and, in fact, the experience of some others, sulphate of alumina is cheaper, safer, more satisfactory and far easier to apply than sulphate of iron and lime.

Having applied the sulphate of alumina with due regard for the alkalinity of the water as evinced by the chemical analysis, the treated water is allowed to flow slowly through a settling tank. The period of time occupied in sedimentation varies greatly with different waters. In some cases one and one-half hours may be sufficient. In others three hours. Occasionally twelve hours are required, and we know of one instance in which six days' sedimentation is employed. In the latter instance chemicals are not used, the biological conversion of the organic matter being aimed at. Generally speaking, however, three hours' sedimentation with aluminum sulphate for a coagulant is sufficient.

KNOTTED HEMP IN THE PHILIPPINES

Some very interesting data have recently been collected by the customs authorities relative to the exportation of knotted hemp, now considered manufactured hemp, but originally included in raw hemp exports. Probably very few people actually know what knotted hemp is, for what it is used, or to where it is shipped.

The industry is quite new, having made its appearance in the islands twenty months ago when orders began to flow in from several countries, mostly from France, Italy and Switzerland, demanding a hemp thread sometimes as long as a thousand feet. The hemp demanded must be of the best grade and pure white for the main purpose for which it is used.

Most of the latest Parisian straw hats are made of nothing less than Manila hemp very closely woven. As a substitute for straw and silk, not only has it a better wearing quality, but it can be woven so expertly as to present exact counterparts of the straw and silk shapes. It is also coming into use for the weaving of stiffening to take the place of haircloth.

The majority of the hemp is tied by women and children in the Batangas district, and as high as 5,000 pounds a week is made ready for market by them. Originally, the consignees shipped spools from the factories to the Philippines where they were covered with the hemp thread and reshipped, and the difficulty of determining the quality of hemp wound on the spools at shipping time made it more expedient for the shippers to ship in hanks, although consignees, at their own risk, may have it shipped on spools if they wish.

The custom house quotes some significant figures in reference to the exportation of this new material. For the fiscal year of 1910, $252,194' worth was shipped, while the first nine months of this fiscal year show exports amounting to $442,631. The greatest increases have been in the trade with France, Italy and Japan. In the fiscal year of 1910 France took $38,392' worth, Italy, $116,047 and Japan, $780, but for the nine months of this fiscal year, the figures of the respective countries stand at $140,834, $790,730, and $8,492. The exportation to other countries for this fiscal year are Belgium, $13,150; Germany, $4,668; Switzerland, $57,831; England $23,480; and United States, $3,351.

When seen recently Mr. O. Ranft, manager of Germann & Company, who shipped over half of the knotted hemp last year, stated that the price, which has always been maintained at 22 cents a pound, is on a gradual decline, owing to the sharp competition between Japan and the islands. All the small fishing villages, when not engaged in fishing, are busily engaged tying hemp, for which such small wages are received that the Japanese market is gradually forcing down the Manila prices.

Then, too, Japan is importing from the Philippines large quantities of raw hemp which is segregated and combed out, even going so far as to compete with the European countries in making the braid. The raw hemp exports to Japan for the fiscal year 1910 amounted to $181,549, and the exports for the nine months of this fiscal year are $180,071, showing that Japan is quickly taking a leading place in the knotted hemp industry.—The Manila Times.

THAT FIRST OVERSEER'S POSITION

BY COLFAX

The life of every successful textile overseer is crowded full of very trying experiences, many of them of a most nerve-racking and heart-breaking character, and while here and there some special incident may stand out more clearly than others as being the most aggravating, there are so many of them and of such a varied character, that it is difficult to select any special one and point to it as the most important in his experience. There, however, is one experience that hundreds of overseers have passed through, that when we stop to thing of it, is perhaps the most trying in the career of most textile overseers.

This occurs at that period in life when they firmly feel that they are competent to leave the ranks of second hands and take their place in the trade as overseers. Particularly is this so of the young man who has struggled hard to acquire the knowledge and experience necessary to make a successful career in what he firmly believes to be his life work, and who is obliged to make this struggle alone, without the aid or influence of others, either in the acquirement of knowledge of the business, or the overcoming of the many difficulties attending securing his first position as overseer.

A good many overseers, of course, have secured their start by simply being patient and plodding along faithfully and conscientiously in some one mill as second hand, eventually being conceded a trial on the recommendation of some retiring overseer. In all such cases there usually is present a sympathetic feeling on the part of the management for the new overseer and the overseers of the other departments also are willing to assist him in making good, so that his road to success is made wonderfully smooth, at least as far as that particular mill is concerned.

But with the real live, ambitious youngster who is not content to wait for promotion, the story is different. He is anxious to be off and fight the battle in his own way, not seeking favors, but just an opportunity to show what he can do, fully satisfied in his own mind that if given the opportunity to prove his ability that fame will shortly be his and that good fortune will surely work overtime for the manufacturer who has the good sense to engage him.

He usually finds, however, that the road to that first position is a hard one to travel and regardless of the large supply of confidence he has in his ability to do things, he generally finds that manufacturers and superintendents are "from Missouri" when it comes to giving him consideration as an applicant for a position and somehow or other there always seemed to be numerous experienced overseers waiting for every position offered, so that it was a case of waiting patiently on the part of the would-be overseer for some accident or freak of fortune to favor him and give him a start.

The writer as a youngster began in a woolen card-room tending the Bramwell feeds in a seven-set room and in due time had passed along successively to creels, to finishers, to strippers, until at the age of 17 a vacancy occurred as second hand and I was given the position. About this time I was very strongly impressed with the idea that a carder was a pretty important chap about the mill. There seemed to me to be a great deal of mystery about him and his duties that were fascinating. He never seemed to be hurried in anything he was doing, but always went about in a serious, thoughtful sort of way. He was consulted very frequently by the superintendent and the owner of the mill and best of all, it was said on the quiet that he received $3.50 per day, which seemed to me to be an enormous sum of money, so that it struck me that here was a life's work worth while taking up and I determined to become a carder.

It was up-hill work for me trying to get inside information from the "boss" as to why certain things were done, but I kept busy all the time and whenever it was possible for me to do so, I always tried to find a remedy of my own for anything that seemed to be going wrong and if not successful, then I noted carefully the "boss'" remedy when I reported to him. This was particularly so if

the "boss" happened to be out of the room and the spinner came in with a report of something being wrong.

I was now reading everything in textile papers that I could get hands on and found many very interesting and instructive articles in them. They also gave me an acquaintance with the mills of the country at the same time; what they were doing in the way of improvements; who was superintendent and the names of the overseers, and they also opened my eyes to the fact that the mill in which I was working was a very small part of the textile industry, and it occurred to me that possibly some other mill might have a better system, or something new in machinery, that might be worth studying and that it might be good policy for me to see what could be done about getting some experience in another mill and with another carder. So I went to another mill to work and after I had satisfied myself as to the value of their system, I selected another mill and finally returned to my old place in the home town.

Feeling thoroughly satisfied now that I was entirely competent to manage a cardroom, the next thing was to find the position, and it was here that my real troubles began, and as I look back now, after a number of years of average success as overseer, it seems to me that those weeks and months that I spent striving to land that first job were the most trying ones of my mill experience. The anxiety and worry at the delay; the constant watching of the textile papers for changes of overseers; the careful wording and writing of letters applying for positions; the registration in overseers' bureaus; the uncertainty as to where that first "boss" job of mine was to be; would I ever get a start and finally, would I make good if I did get a chance.

Naturally a number of notices reached me from overseers' bureaus saying that my name had been submitted to such and such a mill, and in reply to my letter to that mill giving my story as an applicant, I invariably received the same reply; that they had already filled the position but had placed my name on file for future reference.

However, as there is an end to everything in this world, so my troubles in this line finally ended by the receipt one day of a letter from one of the bureaus saying as usual that they had submitted my name for the position as carder with a certain New England mill, the pay was so and so; they had eight sets of cards, making a varied line of knit goods. On the next mail came a letter from the mill mentioned, simply saying that my name had been submitted to them, that they would like to hear from me as to my experience and how soon I could come if they decided to engage me. Now it occurred to me that judging from my past experiences that if I wrote and told them the exact situation, that is, that I was simply a second hand, they would turn me down and insist on engaging someone that had experience as overseer. So instead of writing I wired them saying that I could come at once if necessary and the next day brought a telegram from them telling me that I could come on if I felt that I was the man for the place.

Now I had not been telling everybody of my efforts to secure a "boss" job, and the carder with whom I was working was somewhat stunned when I outlined to him what I was doing, for while he rated me as a pretty good second hand, he had no idea that I had been straining every point to land a job of my own, and while admiring my nerve or ambition, whichever you might call it, he expressed himself as doubtful as to much success coming from my move at this time on account of my age and appearance, which he pointed out would prejudice the management of the mill where I was going, and their lack of confidence in me at the start would prove a serious handicap, and he advised me to let this pass and to stay along with him another year or so, when he would aid me in securing a position and in the meantime I might have every opportunity to improve my knowledge of carding, by his allowing me a free hand in the management of the room of which he had charge.

(To be continued.)

Correspondence and Notes

UPON TEXTILE TOPICS AT HOME AND ABROAD

A HAND BOOK OF WEAVES

By G. H. OELSNER, Director of the Weaving School at Werdau.

Translated and Revised by Samuel S. Dale

(Continued from July.)

I. FOUNDATION WEAVES

This work will treat of the interlacing of two sets of threads intersecting each other at right angles. The yarn running lengthways of the cloth is the warp; that running crossways and carried by the shuttle is the filling or weft. The order in which the warp and filling interlace each other is the weave. Weaves are divided into three classes: 1, Plain; 2, Twill; 3, Satin. From these three classes are derived an innumerable number of other weaves, known as mixed or derivative weaves. Where two or more weaves are used for the same fabric, the resulting weave is called a combination weave; the fabric is called fancy, as distinguished from plain goods made with but one weave.

PLAIN OR COTTON WEAVE

This is also styled taffeta in silk weaving. It is balanced, that is, the warp and filling come to the face to the same extent. The weave covers two warp and two filling threads. At each pick each alternate warp thread is raised above the filling thread, the other warp threads being under the filling. This order is reversed at each pick. For example, at one pick warp threads 1, 3, 5, 7, etc., are raised and threads 2, 4, 6, 8, etc., are lowered in the shed. At the next pick threads 1, 3, 5, 7, etc., are lowered and threads 2, 4, 6, 8, etc. are raised. Fig. 27 shows the manner in which the threads are interlaced in a plain weave. Fig. 28 is a draft corresponding to Fig. 27, and in which the shaded squares indicate that the warp lies above the filling. The blank squares indicate that the warp lies under the filling. Fig. 29 is a cross section of a cloth woven with a plain weave and showing two adjacent warp threads. The black circles are the ends of the filling threads.

FIG. 29.

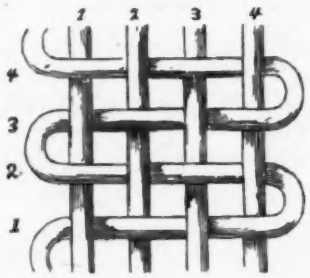


FIG. 27.

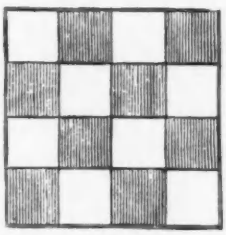


FIG. 28.

A warp set with 40 to 50 threads per inch can be woven easily with a plain weave on two shafts. A better shed can be obtained and the strain and friction on the yarn reduced by increasing the number of shafts as the set becomes closer. A general rule is to have not more than 20 to 25 threads per inch on each shaft.

Cloth woven with a plain weave has a finer appearance and harder feel, and is

smoother, but possesses less elasticity than fabrics woven with other weaves.

The weave draft or plan for interlacing the warp and filling is drawn on "design" or "point" paper, which have upright and horizontal lines at regular intervals intersecting each other at right angles and forming small squares, each of which represents the intersection of a warp and a filling thread. Each space between the upright lines represents a warp thread; each space between the horizontal lines, a filling thread. The marks or points in the small squares indicate whether the warp or filling comes to the face at that point.

FIG. 30. FIG. 31.

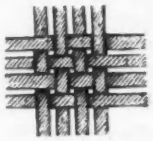


FIG. 32.

Throughout this work the points or marks on the drafts, unless otherwise stated, indicate that the warp is raised above the filling. The exceptions to this rule are found when it is better to indicate the filling floats by points, as for broche effects.

It is plain that a thread can be twisted in either one or two directions, Figs. 30 and 31. The simplest method of designating the direction of the twist is by the terms "right" and "left." Unfortunately the practice in this respect is not uniform. The same direction is styled "right" by a part of the trade, and "left" by another part. The more common custom is to call the twist at Fig. 30 right hand; that at Fig. 31, left hand. This seems to be the almost exclusive practice on the Continent of Europe and in the cotton and cordage industries elsewhere. This custom will be followed in this book when referring to "right" or "left" twist.

The twist at Fig. 30 is also called "openband;" that at Fig. 31, "crossband." The last named method of indicating the direction of twist was derived from the old hand loom method of spinning yarn. The thread is twisted in one direction when the band running from the wheel to the spindle is straight or open, and in the opposite direction when the band is crossed. The spinner turns the wheel by hand so that the top of the wheel moves to the right or away from the spinning spindle.

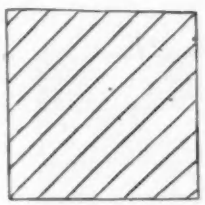


FIG. 33.

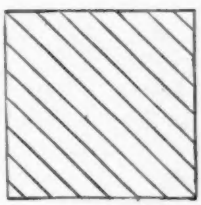


FIG. 34.

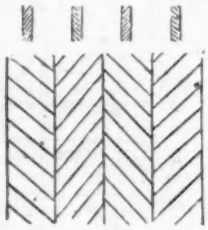


FIG. 35.

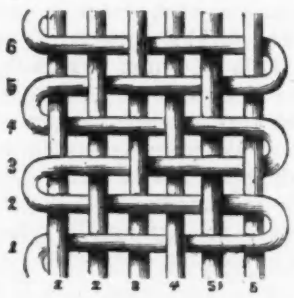


FIG. 36.

The set of warp and filling should ordi-

narily be as near as possible the same. A closer set of the filling is preferable. If the warp is set too close, it is impossible to drive the filling uniformly into the fabric, and the

FIG. 37.

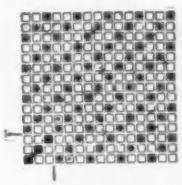


FIG. 38.

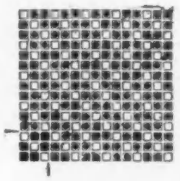
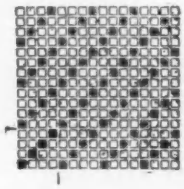


FIG. 39



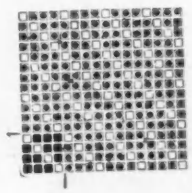


FIG. . 40

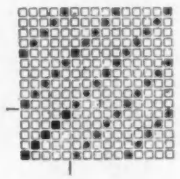


FIG. 41.

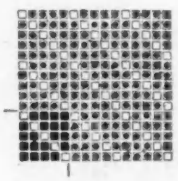


FIG. 42.

goods acquire a ribbed or grooved appearance, crossways of the cloth. This result also follows when the filling is materially heavier than the warp. On the other hand, if the warp is coarse and set very close, while the filling is fine with an open set, the streaks or ribs will run lengthways.

Ribbed effects are sometimes made purposely by alternating coarse with fine yarn in warp or filling. Broadcloth is woven very wide as the weight and handle of the fabric is obtained by shrinkage in finishing. The loom width of wool dyed and piece dyed broadcloths varies from 85 to 95 inches for 6/4 goods.

To facilitate the felting of broadcloths and improve the face it is better to make the warp and filling of opposite twist. Fig. 32 is a plain weave in which the warp twist is openband, Fig. 30, and the filling twist is crossband, Fig. 31.

Tricot effects can be made with a plain

FIG. 43.

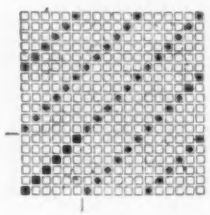


FIG. 44.

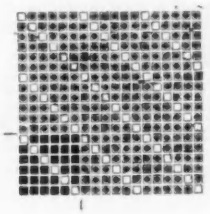
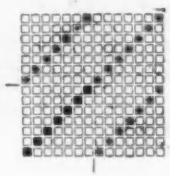


FIG. 45.



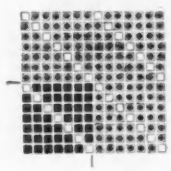


FIG. 46.

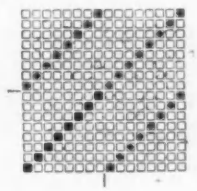


FIG. 4 .

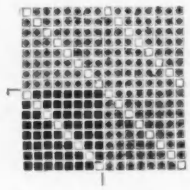
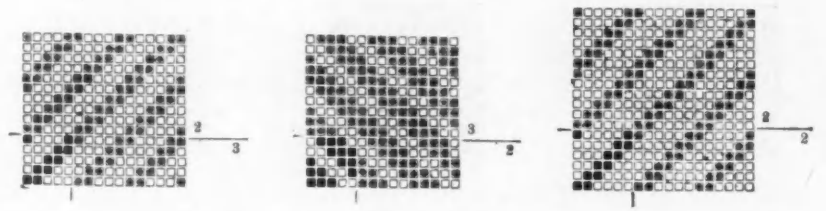


FIG. 48.

weave by arranging the threads in both warp and filling 1 right twist, 1 left twist. To keep the two kinds of yarn separate in weaving, one is usually tinted slightly with aniline so it can be distinguished from the other.

formed by but one warp thread being raised in one place, the threads on both sides being lowered. The first warp thread is over the first filling thread, then the second warp thread is raised over the second filling

FIG. 49. FIG. 50. FIG. 51.



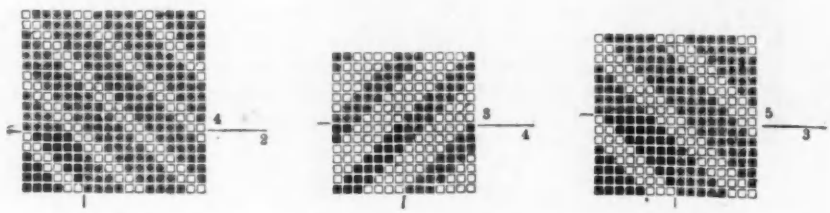


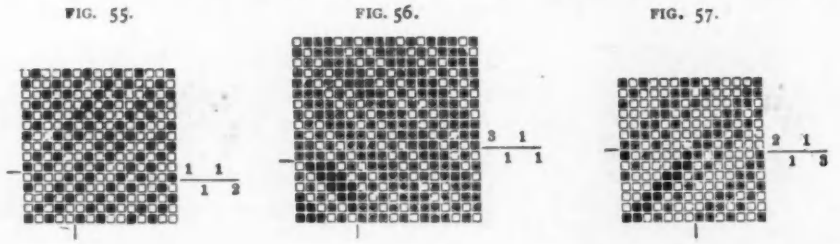
FIG. 52. FIG. 53. FIG. 54.

THE TWILL WEAVE

A characteristic of a simple twill weave is that the float of each filling thread is set one

thread, the third over the third, etc. By this progressive order of interlacing the warp and filling, raised or ribbed lines are formed,

FIG. 55. FIG. 56. FIG. 57.



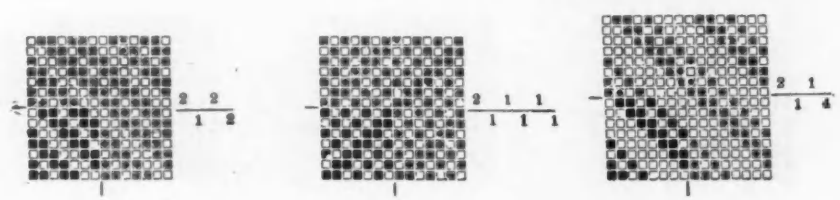


FIG. 58. FIG. 59. FIG. 60.

warp thread to the right or left of the float of the preceding thread. For example, a 3-shaft twill running to the right, Fig. 37, is

running in a diagonal direction. The slant of this twill line is influenced by the set of the warp and filling. If the threads per inch

in the warp are equal to the threads per inch in the filling, the line of a regular twill will be at an inclination of 45°. If the warp set comes to the surface to either a greater or less extent than does the filling.

Balanced twills are those in which the warp and filling come to the surface to the same extent.

All twills covering an uneven number of threads are necessarily uneven, and those with an even number may be made uneven. Balanced twills can be formed only with an even number of threads in the weave pattern.

FIG. 61.

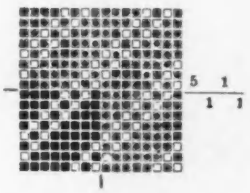


FIG 62.

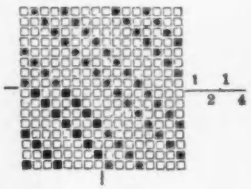
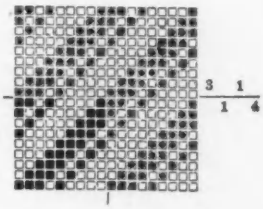
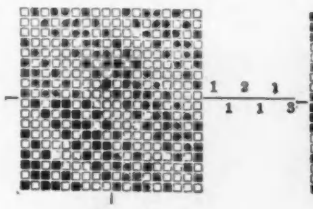
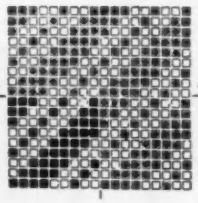


FIG. 63.







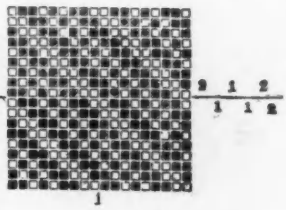


FIG. 64.

FIG. 65.

FIG. 66.

is closer than that of the filling the twill line will approach the perpendicular; if the filling set is closer, the twill line will approach the horizontal.

FIG. 67.

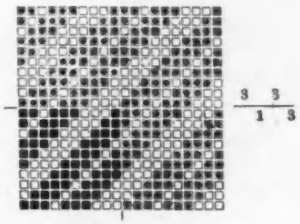
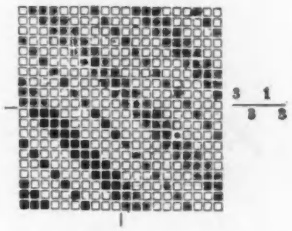
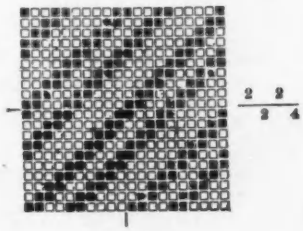


FIG. 68.





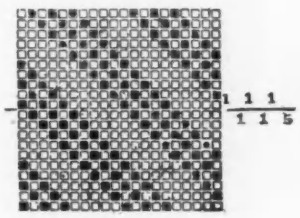


FIG. 69

FIG 70.

Twill weaves are classified as follows:

1. Uneven.
2. Balanced.

Uneven twills are those in which the warp

The line of a twill can be run either to the right, Fig. 33, or to the left, Fig. 34. The directions of the twill and twist of the yarn have a great influence on the appearance of the cloth.

A twill to the right throws up and makes more prominent a left twist warp; it throws down and makes less prominent a right twist warp.

A twill to the left throws down and makes less prominent a left twist warp; it throws up and makes more prominent a right twist warp.

A twill that runs to the right when the

FIG. 71.

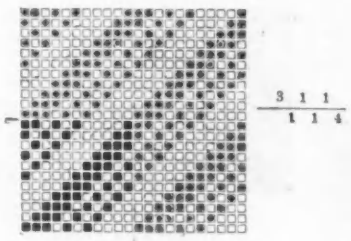
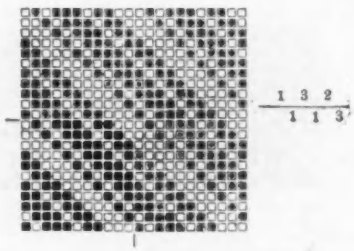


FIG. 72.



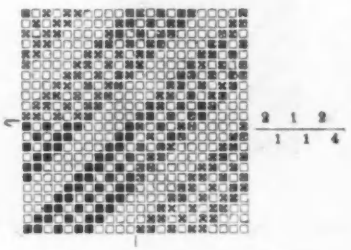


FIG. 73.

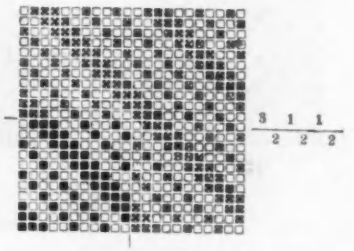


FIG. 74.

FIG. 75.

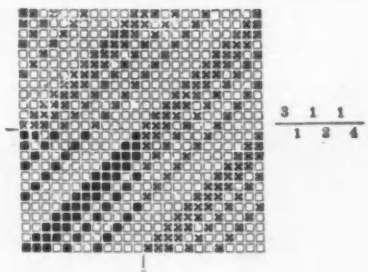
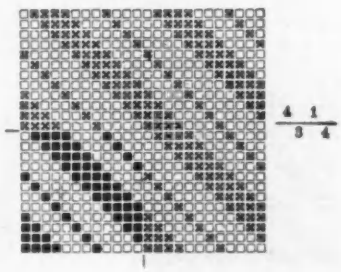


FIG. 76.



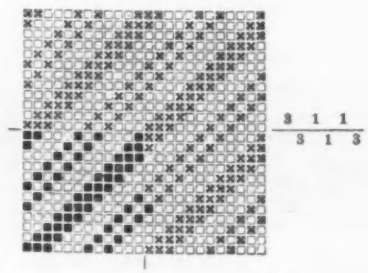


FIG. 77.

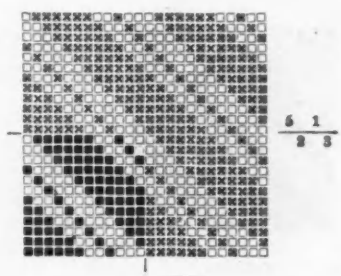


FIG. 78.

FIG. 79.

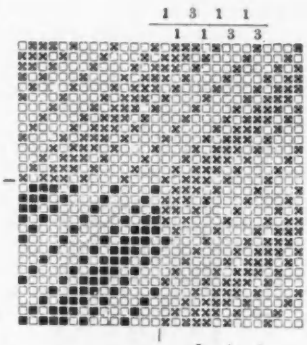
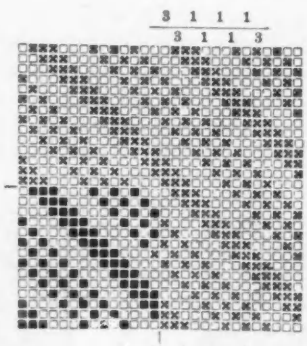


FIG. 80.



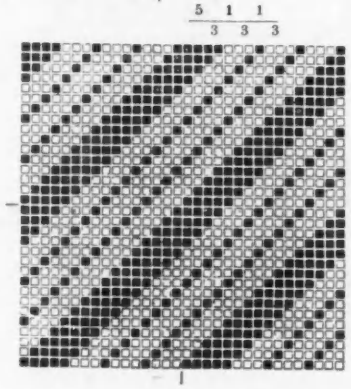


FIG. 81.

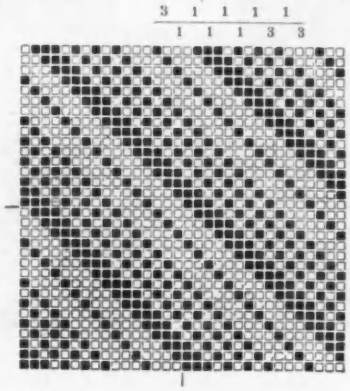


FIG. 8 .

warp threads are in a perpendicular position will be found to run to the left when the cloth is turned one-quarter around to bring the filling threads perpendicular. Thus a

FIG. 83.

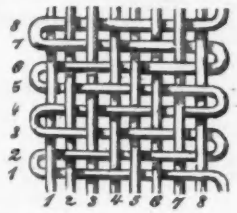


FIG. 84.

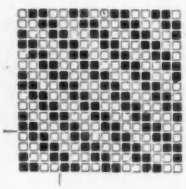
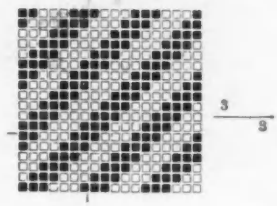


FIG. 85.



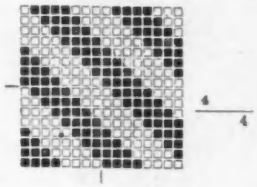


FIG. 86.

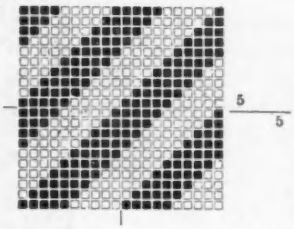


FIG. 87.

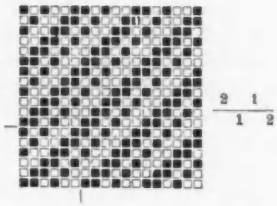


FIG. 88.

twill runs in one direction in relation to the warp and in the opposite direction in relation to the filling. It is the custom, however, to designate the direction of the twill as it runs when the warp is perpendicular. In this sense of the term, a right twill will have the opposite effect on the filling to that which it exerts on the warp. Thus a twill to the right will throw a left twist warp up and a left twist filling down because the twill is in reality left hand in relation to the filling. The various combinations of twill and twist with their effects on the cloth are as follows:

If the twill in a pattern runs alternately to right and left and it is desired to have it equally distinct in both cases, right twist must be used for the yarn in the left twill; and left twist for the yarn in the right twill, Fig. 35.

The threads in a twill weave float farther than when a plain weave is used. The twilled cloth is more lustrous, softer and more pliable than fabrics made with a plain weave.

The number of shafts used for a twill is usually equal either to the number of threads

FIG. 89.

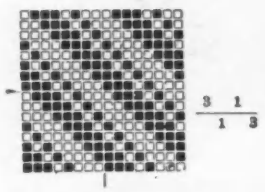


FIG. 90.

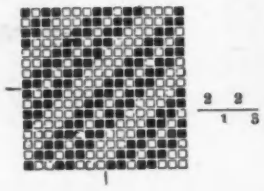
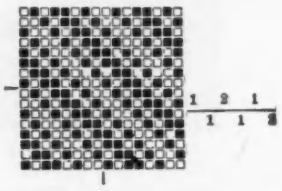


FIG. 91.



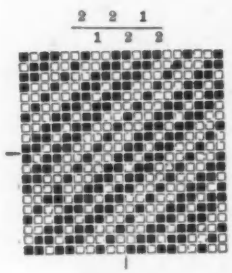


FIG. 92.

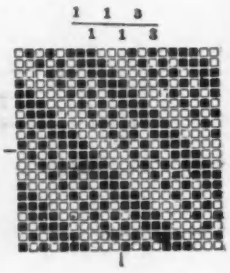


FIG. 93.

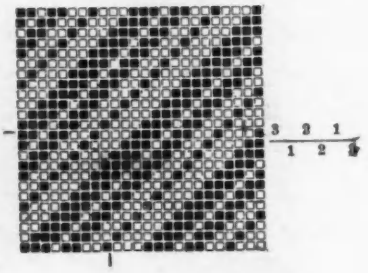


FIG. 94.

	Warp Twill.	Warp Twist.	Filling Twist.	Effect.								
1.	Right	Left	Right	Warp thrown	up;		Filling thrown	up;		Twill not	distinct	
2.	Left	Left	Right	"	"	down;	"	"	down;	"	"	"
3.	Right	Right	Left	"	"	down;	"	"	down;	"	"	"
4.	Left	Right	Left	"	"	up;	"	"	up;	"	"	"
5.	Right	Left	Left	"	"	up;	"	"	down;	Warp Twill		"
6.	Left	Left	Left	"	"	down;	"	"	up;	Filling	"	"
7.	Right	Right	Right	"	"	down;	"	"	up;	"	"	"
8.	Left	Right	Right	"	"	up;	"	"	down;	Warp	"	"

In practice these effects are greatly modified by the quality of the stock, amount of twist, size and character of the yarn, whether single or ply, set of the fabric, finish, etc. As far as the mere direction of twill and twist is concerned, however, the effects are as indicated above.

If the warp yarn is 2-ply the two threads are ordinarily twisted to the left, Fig. 31. The twill should then run to the right, Fig. 33, to make the twill line more distinct.

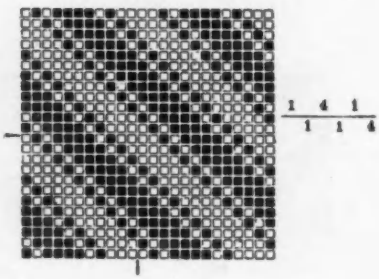


FIG. 95.

in the twill weave or to a multiple of the latter number, making the drawing-in draft straight.

Figs. 36 to 99 illustrate many of the different styles of twill weaves. Those in which which the warp comes to the surface to a greater extent than does the filling are called warp twills. Where the filling predominates on the face, the weave is called a filling twill.

FIG. 96.

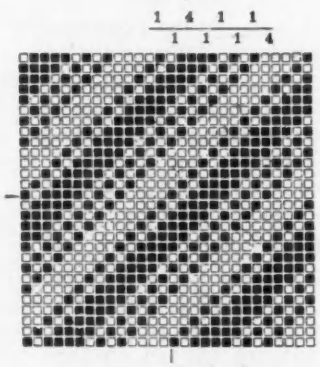
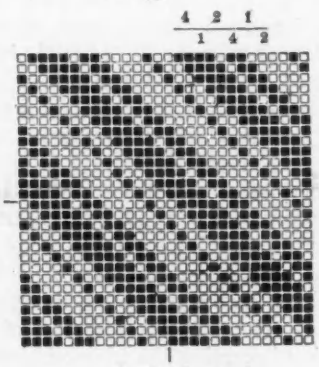


FIG. 97.



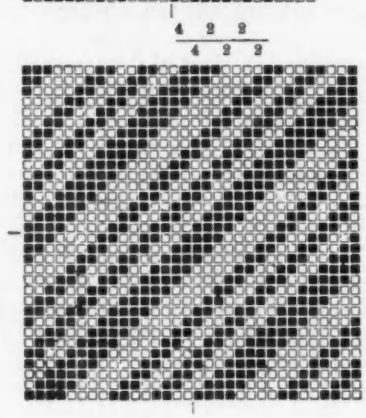


FIG. 98.

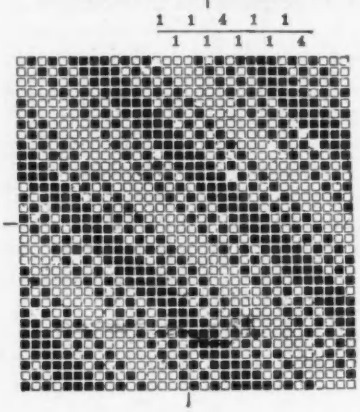


FIG. 99.

For wide twills the draft is often made out in the following form: $^{4}\!-\!_{2}\!-\!^{1}\!-\!_{2}$. This is equivalent to 4 up, 2 down, 1 up, 2 down, producing the 9 shaft twill shown at Fig. 65. These examples give a good idea of the diversity of twill weaves and the methods of combination. Thousands of similar twills can be drafted and with a large number of shafts the number of twill weaves becomes practically unlimited. Twills take the filling much more easily than the plain weave, and the set of twills can, consequently, be closer, making the cloth heavier and more compact.

(To be continued.)

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NOTES ON COSTING COTTON GOODS

BY WEBEREI

The chief consideration when costing a fancy cotton cloth for quotation purposes is accurate estimation of the various cloth particulars. In most cases the manufacturer is supplied with only a small sample, thus rendering his work more difficult. There are, however, many methods whereby a manufacturer may make useful comparisons from a small sample sufficiently accurate as to enable a good and keen quotation to be made.

The first item is the estimation of the number of warp threads and picks per inch; these may be obtained by careful observation in the usual manner. If the warp

threads are not dented evenly then the number of dents per inch must be ascertained.

The class of finish can be estimated from a knowledge of the type of cloth and its general appearance; a comparison with known cloths is, of course, the best guide.

The most important consideration, however, is the estimation of the counts of the warp and the filling yarns and given a small sample there are various methods of procedure. If the sample is about five inches square then it is possible to make use of one of the well known forms of yarn balances where a template exactly 4 5/16 inches square is used. The warp and filling yarns are cut to the length of the template and the number of threads which exactly balance the scale of the instrument indicates the counts. These balances are, however, only accurate for pure yarns and special care must be taken to make due allowance for yarns that contain any percentage of size or filling; such conditions invariably obtain in finished goods. The writer found that one of the best methods of meeting the above objection was to make a series of tests with known yarns finished according to special particulars. Take, for instance, a warp yarn that had been twice sized and then in the cloth had received a filled finish. The counts of this yarn being known it was possible to compare the results given by the yarn balance with any future observations when testing a similar cloth; the results were in all cases kept for reference, being tabulated and filed ready at hand.

In some cases, however, it is even impossible to make use of the template supplied with the balances mentioned above owing to the small size of the sample and then other methods must be adopted. In such cases a template one inch wide is often useful for the number of threads one inch long that weigh one grain multiplied by the factor 0.2314 will give the counts of the yarn. This method is also open to the objections outlined above with regard to sized yarns and often it is impossible to obtain the requisite lengths of yarn to make a complete test.

The most practical method of ascertaining the counts of yarn in small samples is by direct comparison with threads of known count. This method is largely adopted, but there are many pitfalls for the unwary. The yarn of the known counts used should be preferably of the same color as the sample to be tested; it should be drawn from cloth of a similar finish; and it should be approximately of the same hygroscopic condition. As regards these features the writer has known cases where bleached yarn has been compared with colored yarns; where yarn from a bobbin has been compared with yarn drawn from cloth; and where a sample that had been kept in a warm, dry room had been used to compare with a sample that had just come in through the post after traveling for a few days of wet weather. The importance of comparing yarns of an exactly similar character is often overlooked and in many cases leads to erroneous conclusions. Again when testing yarns by comparison, it is important that the counts should be approximately the same, since when the two sets of threads are twisted up their relative diameters are more easily gauged.

After the sizes of the respective yarns have been ascertained the question as to the correct count of reed and number of warp threads to give a required cloth width must be dealt with. Here again comparison with known cloths is extremely useful and strict attention to weaving conditions is essential if correct estimation is to be ensured. Then comes the quality of the dyeing in the sample yarns (if colored), the amount of sizing and a consideration of the method of warp preparation best adopted. This latter is a question of some importance in the manufacture of colored goods, since some methods of warp preparation are much more economical than others. The number of colors or the different counts used in the warp is a factor that affects this matter, as also is the quality of the cloth to be produced.

Once the factors enumerated above are obtained then the cost of the cloth and the various departmental charges to be added are matters of routine, due care being paid to the accuracy of all the figures involved.

ENGLISH NOTES

By Our Special Correspondent

Lancashire is firm in the expectation of good orders for woven cottons this fall and weavers have every prospect of doing better out of the business than spinners. Difficulty has been met in bringing spinners into line over the Saturday stoppage, as some contracts are more remunerative than others. On the whole it pays better to buy yarn than to make it. As soon as it is evident that weaving mills are making good profits a demand for an advance of weavers' wages will be put in. A demand for 10 per cent. already formulated has been deferred.

The autumn pospects for woolen and worsted fabrics are more uncertain. The domestic business in dress goods is dull and no more large buying need be expected this year. Export orders are falling off but may revive after the harvest. In men's worsteds the mills are steadily working along without suffering material inconvenience from the three weeks' stoppage in combing. The stoppage has put a strain on some of the shorter purses in the wool market, but has not prevented the buying-up of the English clip at higher prices than it can immediately be sold for.

* * *

The tariff matters which so agitate America are taken very quietly on this side. The rather scanty news is followed regularly and a fair understanding of the main points under discussion is shown by the textile people one meets. There is no widespread expectation of an early settlement. So far as can be learned the Tariff Board inquiries meet with a friendly response, but some of the information sought is not recorded. Thus it is not usual in England to keep separate records of the scoured weight of each purchase of wool. The wool is blended before scouring and it is possible that fuller information could be got from wool scourers in Australasia and South Africa than from topmakers in Bradford. While up to the present the official inquiries have been principally about raw wool, it is known that arrangements are being made to visit one large weaving mill in Bradford. Mr. Graham Clark's work has been temporarily diverted from the cotton to the wool schedule and the Board's Chairman is traveling about acquiring general impressions and is to make a series of revisits later on.

* * *

The preliminary census figures of the American knit goods industry (1909) make an interesting contrast with those for the United Kingdom (1907):

	U. S.	U. K.
Total products	$198,812,000	43,445,000
Hose and half hose	65,031,000	21,630,000
Shirts, pants, combinations	83,814,000	13,360,000
Gloves	7,260,000	1,280,000

The tables are not constructed to match and comparison cannot be carried into detail, but enough has been quoted to show that the American industry is the larger by almost five to one. Yet we think the British industry has come on marvellously and certainly enough to affect the old trade in flannels and to upset the habits of dressing. People who used to change their suits and dresses with the season now change their knitted underclothes. There is external evidence that a much larger proportion of cotton is knitted in America than in England and climatic conditions would go far to secure that. Knit goods in this country is nearly synonymous with wool or with woolen (i. e., mainly wool) and worsted spinners are continuing to devote more attention to knitters' consumption.

* * *

William J. Johnson's paper on stream pollution might be illustrated from English example at many points. Although there are companies in Yorkshire making good profits of distilling extracted wool grease, there are none for collecting crude effluent at central points and purifying it. That work falls to the municipalities and after many years of failure the Bradford Corporation has so advanced in its methods as to make $150,000 a year out of grease recovery. A large plant has been put down and woolwashers and others who a few years ago were fined for sending crude effluents into the sewer are

now beseeched not to attempt to purify their wastes. The position of English manufacturers under the laws is highly irregular. Some have acquired rights by user, some can use the sewers on payment, and some cannot use the sewers at all. Some of them separate their effluents in accordance with Mr. Johnson's suggestion, treating the heavily polluted portion and passing the cleaner fluids back into the stream, but this does not necessarily satisfy the Boards which have charge of our rivers. Some have to pump their waste waters once or twice, some have land available for purification and others have none. Except for the knowledge that there will sooner or later be trouble if you pass waters containing more than a small proportion of insolubles into the stream, everything is chaotic. The smell from the grease works outside individual mills is nothing like pleasant in summer. The stench from the Bradford Corporation works and from the premises of grease-refineries is devastating to whole regions around.

The engineers who have had most experience in constructing filters for purifying the effluent from mills are the last men to dogmatize as to what will or will not prove satisfactory. They will construct a plant and will advise and suggest changes for producing a passable result, but they know, and the Rivers Board men know, that effluents from different mills in similar trades differ strangely. The filtration which answers here does not answer there and all manner of material is tried for filter beds. The Rivers Board disclaims all responsibility. It guarantees nothing but prosecution in case you fail to maintain its arbitrary standard, no matter what the expense to which the manufacturer has been put in attempts to satisfy the official demand. The Boards are purely repressive authorities without executive powers and their replacement by guardians of a different order has been promised and neglected for many years.

* * *

The "Serpentine" crepe that a Lawrence firm is advertising and selling in this country retails at 19 cents a yard, is offered in a bountiful selection of dyed shades and a few printed styles. Domestic goods of somewhat similar character sold at around 12 cents last year, but these were not advertised as proprietary articles and sales of them this year have been small. The crepe is cotton, but drapers have been making acquaintance also with American silks—the "Seco" American habutai. Mercerized mufflers from Milwaukee have been on the market for at least a couple of years and must have sold well at a remunerative price. These are followed now by American silk stockings, which are also sold under a brand. Nothing is heard of any American wool goods other than rags, which still arrive plentifully. A large firm of shippers in the Eastern States has appointed an agent in Batley for the sale of its rags.

* * *

The English factory inspectors in their new report point out that in Germany the industrial accident rate is less by night than day. How far the explanation is fanciful is not clear, but the suggeston is that there are fewer raw hands engaged on night work, fewer interruptions, less crowding, less transport of material and more leisure and care. The reports tell of the constant frustration of the benevolent intentions of the British legislature. Occupiers of humidified weaving sheds have to provide dry cloak rooms with certain arrangements for keeping clothes away from the wall. But "the great majority (of weavers) prefer to take their clothing into a shed they know to be excessively damp." Then in the matter of "time-cribbing" the operatives conspire with the manager to beat the law. Inspectors complain that managers who want to run the engine in prohibited time set watchers out. In a Rochdale mill an elaborate installation of electric bells was used to give warning from the time-office that the inspector was at hand. The inspectors say nothing against the legislators who impose the restrictions which nobody wants to keep.

* * *

Fashion and the operations of American buyers have made cotton velvets unprocur-

able in any reasonable length of time, and orders have to be placed very far forward. The major demand is, of course, for dresses, and the requirements of the furnishing trade are a relatively small thing. Still there is a good sale for velvet curtains dyed in soft shades and printed or stencilled in designs with paint. Ornamented velvet is run round

HAND STENCILLED COTTON VELVET.

shelves and mantel pieces to form borders, and strips of it are being sewed as borders on table cloths. Two patterns, hand-stencilled in three colors are sent to show what is done in this direction. The stencilling is done lengthwise along the piece in paint and terebene varnish and the cloth is hung to dry over rods. Stencils of zinc or oiled paper are used and secured in position with pins. The use of velvet is an outgrowth of the larger business in paint-printed plushettes. Either plain or printed, these cow hair and cotton plushes are largely used for portieres.

John Crossley & Sons, Ltd., of Halifax, who have finally pitched on Easton (Pa.), as the site of their long-contemplated American mill, have for half a century been the largest English makers of carpets. At one time they carpeted more than a little of America, where they had a trade of $2,375,000 in one year. This has since been as little as $25,000 and the new mill is intended to bring some of the old business back. That Crossleys ought to have put down an American plant in the first days of the McKinley Tariff has been admitted unofficially on more than one occasion. Also in an unofficial way it has been confessed by their neighbors and competitors, the Firths, that much of Firth's good profits was of American manufacture. As T. F. Firth & Sons have within a few years doubled their English plant, they have presumably found the domestic trade encouraging also. Crossleys

have stopped growing, have repaid capital which they could not profitably employ and have palpably needed new developments.

* * *

The woolcombing industry, in which there has been an awkward labor stoppage, is a naturally fluctuating one. Some spinners and more topmakers have combs of their own and rely on the commission sheds only to get their surplus wool combed. Commission combers do most of the work and in the portion of the year in which the new clip is arriving night work is general. As the pressure eases night work becomes intermittent or stops. The employment is casual and is followed by rough types of men, some of whom work in one shed tonight, in another tomorrow and perhaps do nothing for the rest of the week. These are the men who provoked the strike, forbade all working and hustled the day workers away from the machines they did not wish to leave. Two causes of the trouble are clear: The unexampled prosperity which has made night work practically continuous for two years; and the agreement made by the employers to engage all night men through an ill-disciplined and badly managed labor union. The strike concerned inside organization and the control of work rather than wages. The combers want a minimum wage of $6.25 a week. Some receive more than that already, but in general this is the wage that unskilled labor, textile or other, commands in this country.

* * *

Next year is to see a boom in waterproof caps and hats in this country. At Stockport, the center of the batting trade, works are being opened for performing the proofing process on commission. Cloth for caps and hats is treated in the piece with acetate of alumina and wax. Hard felt hats are regarded as waterproofed by the shellac contained. Soft felts of the sort long favored in America are only beginning a real popularity here, and they are treated after dyeing with a solution in which acetate of alumina is the principal ingredient. Cloths of a fleecy, blanket character, not specially suitable for proofing, are the present fashion for caps. Hard, close textures give better results in resisting water.

A WOOLEN BLANKET MILL

From Uhlands Technische Rundschau

Translated from the German by the Editor of the Textile World Record.

The accompanying drawing illustrates the woolen blanket mill for which the plans were made by the Grossenhainer Webstuhl und Maschinenfabrik, Grossenhain, Germany. It is one story throughout with shed roof. The beltway divides the mill into two parts, in one of which are nearly all the preparatory machines while in the other are the finishing machines. The outside and division walls are all stone, the pillars and beams are of iron, the only wood being the planking in the floor and roof. All of the work rooms are supplied with light from above. The only windows in the side walls are found in the boiler house, K, and the power house, L. As a result the building presents a rather monotonous appearance from the outside, see Fig. 1. The back side of the mill is relieved by windows and gables of the rooms, K and L, Figs. 3. The work rooms are arranged so that the material is always found convenient to the succeeding process. The wool goes first to the scouring machine, c, in the room, E, near which is a centrifugal extractor, d. The adjoining room, F, accommodates the wool drying machine. The rag picker in room, D, and the dusters, n and m, loosen the raw material and remove the sand, dust and other foreign substances preparatory to mixing for the cards, a. The stock is oiled and picked in the rooms, G and C, from which it is delivered to the cards, which in turn deliver the roving to the mules, y. In the card room, B, are found the grinders, b^1, and the card clothing frame, b. After the warp yarn is spooled on the machines, x^1, it is taken to the warpers, x, where it is converted into warps and beamed ready for the looms. When required the warps are sized on the machine, O.

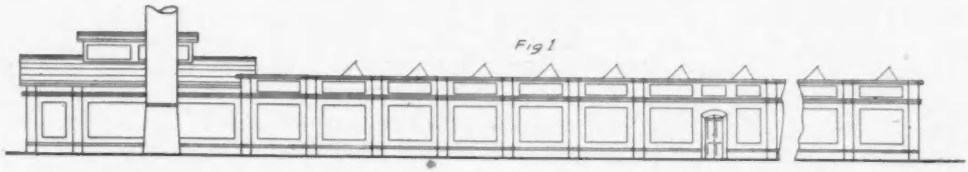


Fig 1

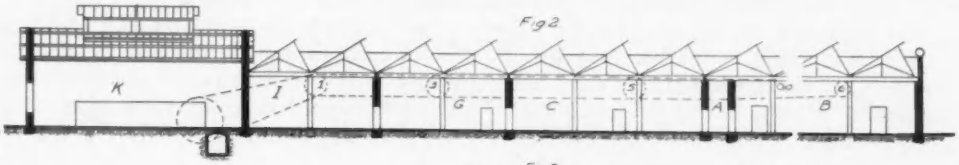


Fig 2

Fig 3

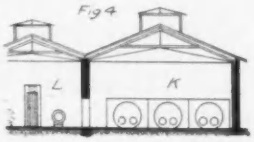


Fig 4

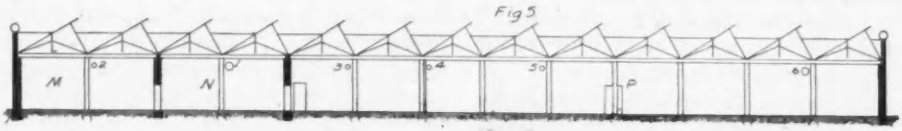


Fig 5

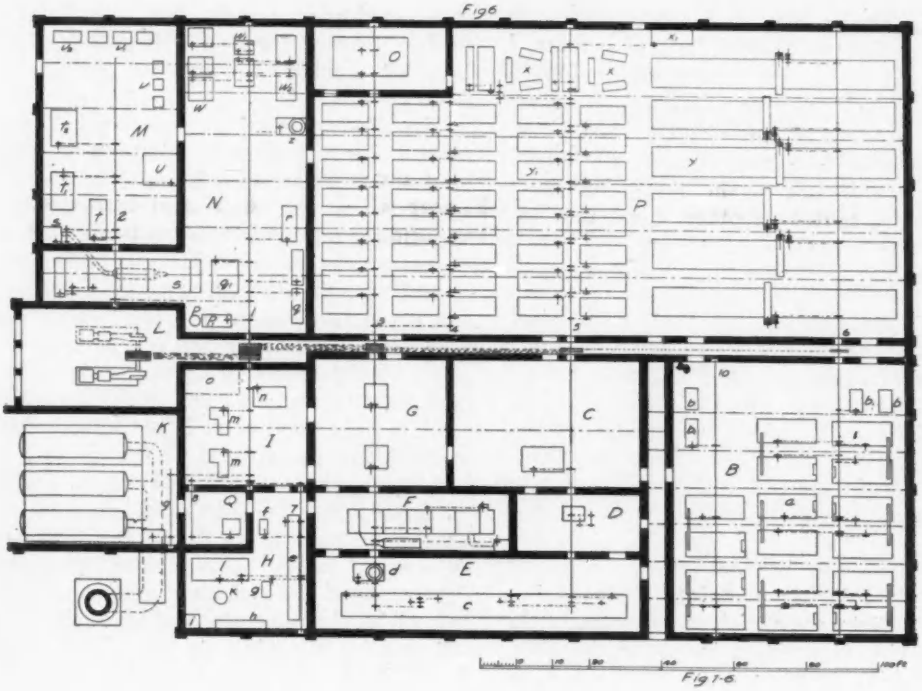


Fig 6

Fig 1-6

The following machines are found in the finishing department: The hammer fulling mill, w, and the rotary mill, w^1; the cloth scouring machine, w^2, near which is a centrifugal extractor. There is also a napper, r; a beater, q^1; shearing machine, t^2, and a brushing machine, u. In order to prevent the goods from shrinking after being finished, they are decatized on the machine, p. The blankets are pressed in the rotary press, t^1, and stitched on the sewing machine, v. After being burled and specked on the machine, v^1, the blankets are examined on the perch, v^2. So far as possible the various machines for each process are grouped in the same room. The machines that give out a dust or emit steam are set in separate rooms. This arrangement is shown at Fig. 6. The corridor, A, 4 ft. wide, leads to the card room, B, which is 64 ft., 3 in. wide by 76 ft., 6 in. long. Two doors lead directly to the spinning and weaving room, which can also be reached directly through the corridor, A.

The picker room, C, is 33 ft. wide and 36 ft., 9 in. long, and is reached from the corridor, A. The room, G, behind C is 34 ft., 6 in. wide and 36 ft., 6 in. long and accommodates the dusters. Dusters are also located in room, I, which is 34 ft., 6 in. square, and is located next to the boiler house, K, and the power house, L. Next to the rooms, I and F, is a repair shop, H. A space, Q, is partitioned off to accommodate the dynamo machines. The repair shop, H, contains a screw cutting machine, f; a planer, l; a drill, g, and a lathe, e, besides a work bench, h, and a forge, k. The boiler house, K, contains 3 boilers with which is connected a Green fuel economizer.

The power house, L, contains a double compound engine carrying the main driving pulley. The power house is 43 ft., 4 in. long and 26 ft., 10 in. wide, and can be reached from the yard as well as from the boiler house. It is covered with a monitor roof with open slats to allow the escape of heat and gases.

The large spinning and weaving room, P, behind the belt way, contains 6 mules and 40 looms. Eight rows of iron posts carry the roof, which is 17 ft., 9 in. above the floor. Adjoining the weave room is the room, O, in which the sizing machine is located. It can be entered from the room, P, by two doors. Next to the weave room is the napping room, N, which is 34 ft., 6 in. wide and 35 ft., 3 in. long. There is also the space, m, in which the tentering machine is located. Adjoining is the sewing room, M, in which the folding machines are also placed. The arrangement of posts and beams is shown plainly in Fig. 6, which also shows the method by which the power is transmitted to the different rooms. The offices are located in a separate building not shown in the plan.

THE EVENER MOTION AND ITS ADJUSTMENT

By LEANDER.

The production of an even, well rounded thread or yarn requires an even roving from which to spin the yarn. Following the process back, it becomes evident that in order to produce even slivers and rovings we must have an even lap. Unless we start with as even a lap as possible, we are sure to end with a more or less uneven yarn. This is true notwithstanding the fact that the stock passes through many doublings and drawings, all tending to overcome any unevenness in the stand.

The production of an even lap has often proved a troublesome problem. The stock, in the first place, must be well opened. It should be of the same density throughout the mixing pile. The fact that we feed the cotton to the breaker picker in bulk makes it necessary that it shall be of the same density, or as nearly so as possible. The cotton is put into the hopper and fed into the machine by the elevating apron, made of ribs into which sharp pins are set. These pins catch the fiber and carry it up. The surplus stock carried up by the elevating apron is removed and thrown back into the hopper by the spike roll. The method of altering the weight per yard of the lap is by regulating the amount fed in. This is done by varying the speeds of the elevating apron and spike roll, or by changing the setting of the spike roll to the elevating apron. Now if we should feed cotton of varying density to this

hopper it would mean that laps of varying weights per yard would be produced, due to the fact that the denser cottons would weigh more for the same bulk. It follows, then, that the mixing should be carefully made and the stock well opened.

Other things influencing the evenness of the breaker laps are the beater speeds, fan drafts and the adjustment of the dampers. The bulk of American cottons are given three processes of picking. After the first process, the breaker laps are then doubled and drawn by a second process known as the intermediate picker. The third process con-

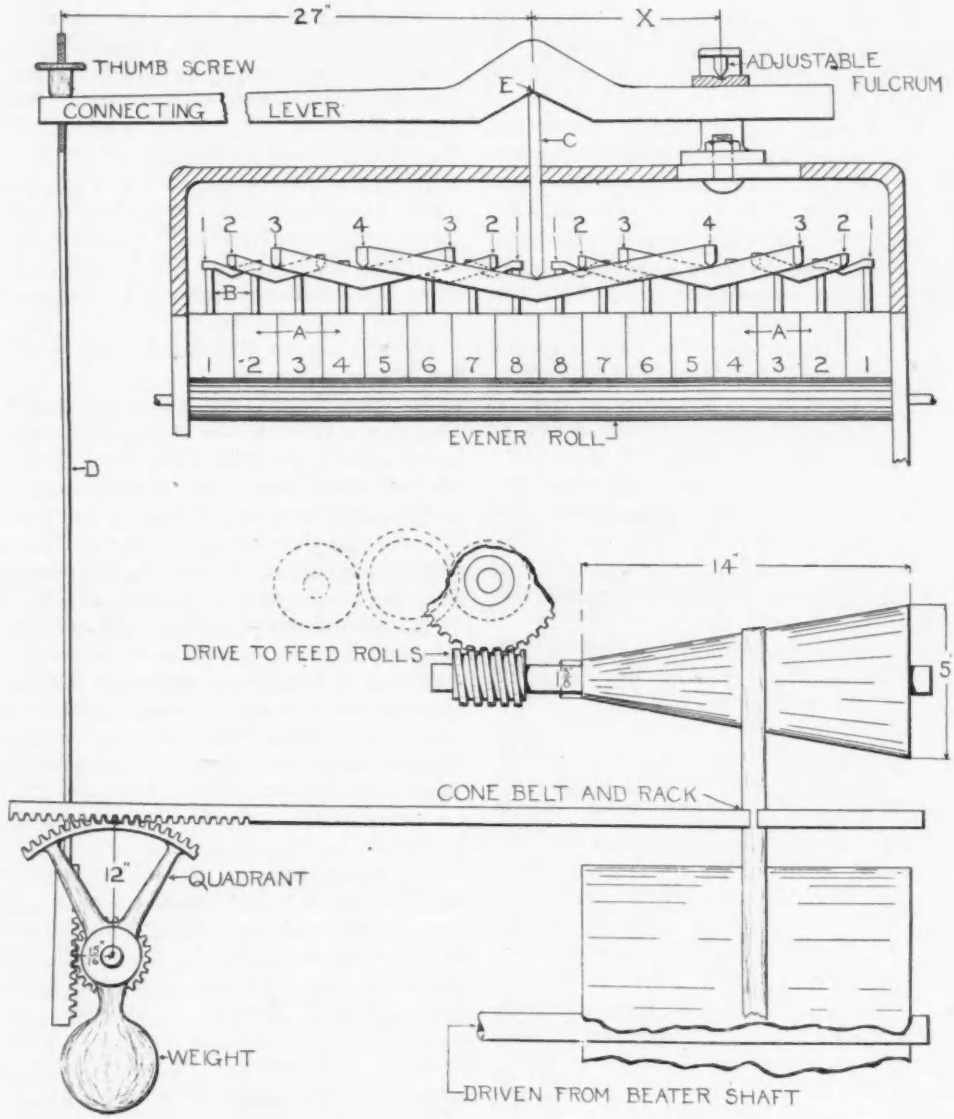


FIG. I.

sists of doubling four intermediate laps and drawing them out to the finished lap. From the breaker picker to the spinning frame the stock is subjected to doublings and drawings to even it up. In the picking process we obtain—using three processes—a total of 16 doublings, four on the intermediate and four on the finisher.

In addition to the doublings, we obtain another evening action from a device known as the evener motion. This device is operated by the bulk of the cotton passing under the plates. Its operation depends upon the fact that different weights of cotton are of different bulk. Its evening properties are obtained by increasing or decreasing the speed of the feed roll as the case may require. Its action, therefore, is one, tending to feed the same weight of cotton per unit of time. If the cotton is abnormally heavy it reduces the speed of the feed rolls, thus feeding the stock slower. If the stock runs light the speed of the feed rolls is increased and the stock fed at a faster rate. It can be said that the draft is automatically changed by varying the speed of the feed rolls to suit the weight of the stock entering.

Fig. 1 shows a diagram of the Perham and Davis evener motion. The top portion, consisting of the evener box, containing the plates and levers, is placed over the combined laps entering between the evener roll and the plates, A 1 to 8. The lower portion of the drawing shows the quadrant, rack, drum and cone with the connecting rod and the drive to the feed rolls. Actually this lower portion of the drawing is carried on the side of the picker, but is shown in the position at Fig. 1 that it may be the more easily explained.

The evener plates, of which there are two sections, A 1 to 8, are 16 in number. They are hung on a rod and carry in a socket near the lower end, the rods, B, which project up through a bearing and support the small levers, 1. The arrangement is such that plates, A 1 and 2, 3 and 4, 5 and 6, 7 and 8, are coupled in pairs by means of small levers, 1. These small levers are connected and coupled by means of levers, 2. These levers then couple up plates A 1, 2, 3 and 4 and A 5, 6, 7 and 8. Then the levers numbered 2 are compounded by the levers numbered 3 which couples plates A 1, 2, 3, 4, 5, 6, 7 and 8. This system compounds the two sections of levers and it only remains to connect the levers numbered 3 by the lever, 4, to complete the compounding so that the action of one single plate may be transferred to the connecting lever. Lever, 4, is joined to the connecting lever by means of the pin, C, which transmits any movement of the evener plates to the connecting lever, which, through the rod, D, and the quadrant moves the rack, thus changing the position of the cone belt on the cone, which changes the speed of the feed rolls.

We will assume that a heavy mass of cotton passes under the evener plates. Owing to its extra bulk it will cause the plates to rise. This will lift the multiple system of levers causing the pin, C, to rise. This will lift the connecting lever and through the rod, D, and rack will cause the quadrant to be swung to the right, moving the cone belt rack to the right and changing the cone belt to a larger diameter on the cone. This will give a slower speed to the feed rolls, compensating for the extra weight entering. If a light place had passed under the plates the opposite would have occurred and the feed rolls would then feed faster. If a heavy place occurs in one spot in the lap it will act on say 2 or 3 plates and will raise the pin, C, a corresponding amount causing the belt to be thrown to the large end of the cone. If two uneven places occur in the lap, one being as much heavier as the other is light they will neutralize each other and there will be no movement of the cone belt. The evener motion does not overcome uneven places in small sections of the lap. Such thick and thin places are overcome through doubling. The evening obtained from the evener is in the weight of yard lengths.

The following tests show the percentage variation in the laps from the breaker, intermediate and finisher pickers. The stock was a strict middling grade of uplands, about 1 1/8 inch staple. It was thoroughly opened and mixed before being fed to the breaker.

(To be continued.)

Questions and Answers

Under this head we undertake to answer, free of charge, to the best of our ability, questions pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

If the question is not of general interest to textile readers and involves expensive investigation, a charge covering the cost may be made, of which the inquirer will be advised before any expense is incurred.

CLOTH CROCKING

Editor Textile World Record:

I enclose a sample of cloth that crocks. You will notice the dust flies at point of rupture when cloth is torn. The sample is from a piece that was returned to us and which has been scoured a second time, then sent to the dye house and chromed with 3 per cent. bichromate, 3 per cent. oxalic acid. It still crocks as you will see. The goods were dyed as follows:

15% Glauber's Salt, necessary dyestuffs.
5% Acetic Acid, boiled ¾ of an hour.
3% Sulphuric Acid, boil ¼ of an hour.
1½% Bichrome, boil ½ hour.

Kindly give us the cause and remedy for this crocking. Anderson (1912).

It is difficult to answer this question in a manner that will be satisfactory, as no mention is made of the preparatory treatment through which this cloth passed before dyeing.

The fact that the color crocks leads to the belief that a proper choice of dyestuffs was not made, not that the dyes used were not proper for wool, but that they were not entirely taken up from the dye bath before being after-chromed, thereby causing a deposit of color on the fiber rather than the fiber being dyed through and through.

The further chroming after scouring no doubt had the tendency to cause the fibers to become harsh and brittle, the inevitable result of over-chroming. This is confirmed by examining the dust which falls from the cloth when torn, which consists entirely of minute fragments of wool fibers.

No remedy can be given for cloth that crocks. The proper thing to do in such a case is to wet the goods out thoroughly and strip with hyraldite and redye. To "cobble" or "doctor" defectively dyed or finished pieces has never proven satisfactory.

Dr. Louis J. Matos.

BLEACHING RAMIE YARN

Editor Textile World Record:

Can you give me a suggestion as to how to bleach the darker of the two enclosed samples a pure white? I want a method of treating the tubings to get them white. The enclosed samples are made from ramie yarn, the darkest piece being domestic and the clear white made from imported ramie yarn. Lenox (1917).

The tinctorial properties of ramie are similar to those of cotton. The cheapest way of bleaching ramie is with chloride of lime. The material is first boiled off either in an open tub or a closed kier. The more care given to this operation the better will be the results of the bleaching process. It is indispensable to add to the boiling bath 3 to 6 per cent. of calcined soda or 1 to 3 per cent. of caustic soda at 38° to 40° B. A small quantity of rosin soap is sometimes added and the ramie is boiled for 5 to 8 hours. The boiling-off is sometimes done with soda and milk of lime, which corresponds theoretically to boiling with caustic soda, but at a somewhat lower price. After boiling off the material is rinsed and then immersed in a bath of chloride of lime 1/2° to 1° B. It is better to prepare a fresh bath every day. After leaving the ramie in the bath for 6 to 10 hours, it is removed, rinsed and soured with dilute hydrochloride or sulphuric acid. The material is then rinsed thoroughly, passed through a hot soap solution and blued with Outremer blue.

When a pure white is desired the material is subjected to this process a second time. At the second treatment the bleaching bath is either made weaker or the material is left in a bath of normal strength for a shorter time. The large bleacheries use special kiers in which the material is subjected to the boiling-off, bleaching, souring, rinsing and soaping operations without being removed,

thus reducing the cost of labor. In the small bleacheries the material is boiled in open tubs made either of copper or wood. The bleaching, souring and other operations are carried on in wooden tubs containing about 100 pounds of material. The proportion of material to liquor is about 1 to 20 pounds by weight. Care should be taken to avoid having any solid pieces of chloride of lime in the bath, which should be perfectly clear and not too strong. The material should be stirred constantly. If these precautions are not taken there is danger of tendering the fiber. In some establishments the solutions are left standing for some time before being used in order to get a perfectly clear liquor. Care should also be taken to keep the ramie submerged in the liquor, otherwise contact with air will result in its becoming tender.

Gaul.

Goods of this material are usually bleached with sodium hypochlorite, although some bleachers prefer to use the ordinary solution of bleaching powder which is diluted to stand at 1 1/4° to 1 1/2° Tw. The most satisfactory method is to use the sodium hypochlorite solution prepared as described below. The actual bleaching may be done in wooden tanks of sufficient capacity to hold several hundred pounds of goods, or the bleaching may be done in an open tank over which is mounted a slowly revolving winch worked by hand or by a chain. This gives the bleach boss entire control of the operation.

Ramie should be bleached cold, and after the process has advanced sufficiently for the grade of white desired, the material should be thoroughly rinsed with clean water, afterwards with one water containing a very small quantity of muriatic acid, followed by a thorough rinse wth clean water. If bleaching is effected with bleaching powder solution instead of sodium hypochlorite, the use of muriatic acid is all the more necessary on account of the harsh feel generally imparted to the goods when oil of vitriol is used.

Sodium hypochlorite is prepared by the bleacher in the following manner: Dissolve separately 100 pounds of 33 per cent. bleaching powder in 40 gallons of water, and 60 pounds of soda ash in 20 gallons of boiling water, afterwards diluting with 10 gallons of cold water. The soda solution is then mixed with the bleaching powder paste, well stirred for one-half hour and allowed to settle over night. In the morning the clean solution is drawn off and the residue washed with several changes of clean water, the wash waters being added to the main solution to bring it up to 150 gallons standing at 6° to 7° Tw. Now add 1 1/2 to 2 pounds of soda ash, allow to dissolve and let stand over night, when all the lime will be thrown out of solution. It is then ready for use by simple dilution in water.

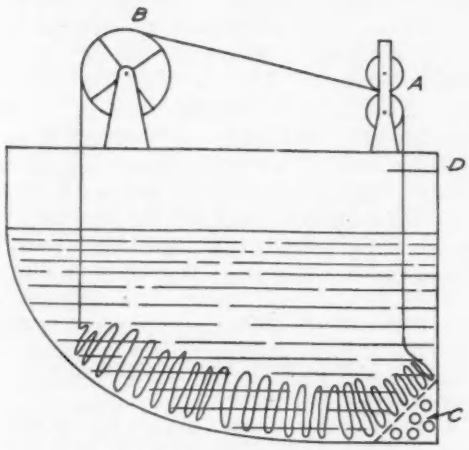
Care should be exercised in bleaching ramie not to allow it to remain in the bleach solutions longer than necessary to produce the degree of bleach desired, and further, to use as weak a bleach liquor as possible. Slow bleaching is always more thorough than rapid bleaching. Good washing after bleaching is equally as important as the proper strength of the bleach solutions.

Berwick.

Knit goods of ramie yarn may be bleached in the piece by the following method: The goods are first scoured or boiled out in a solution containing 2 per cent. of soap and 1 per cent. of Turkey red oil, the cloth being run for one hour in this solution at a boiling temperature. The best way to handle the goods would be in a string-tub machine, where the goods are operated on in the form of a long string which is carried through the scouring bath and up through squeeze rolls and then over a large reel or winch, from which they fall back into the bath again (see figure). From eight to twelve strings of cloth may be run at once, each string being kept in place by passing through a pot eye or pin bar as it comes up from the liquor and before it reaches the squeeze rolls.

After receiving a thorough scouring the goods are rinsed with warm water until all the soapy liquor has been removed. They may then be bleached by a number of processes.

(1) For a bleach which will yield a very soft fabric and retain the full strength and durability of the fiber, it is recommended to use the peroxide method. A bath should be prepared containing 10 gallons of hydrogen peroxide solution (of 10 volume strength) with 20 gallons of water and one pound of sodium silicate. A machine similar to the scouring vat may be used for bleaching, only no metal parts must be allowed to come in contact with the solution, and the steam-pipes for heating must be made of lead. The



CROSS SECTION OF SCOURING VAT.

(a) Squeeze rolls. (b) Reel. (c) Coil of steam pipes beneath a perforated wooden partition. (d) Pin bar or pot eye.

goods are started in this bath cold, and the solution is gradually heated up to 180° F. After the goods have run for one hour, the strings are untied, taken from the reel, and completely immersed beneath the liquor, and allowed to stay overnight. They are then removed to the scouring machine where they are finally given a rinse with warm water, and the bleaching is finished.

(2) For a cheaper bleach the chloride of lime method may be used. The goods are first boiled out in the manner already described. They are washed free from soapy liquors and then bleached by running in a cold solution of chloride of lime (chemic) standing at 1 3/4° Tw. It will require about one hour treatment in this bath. Then the cloth is well washed in cold water, and next given a treatment with 5 per cent. (on the weight of the goods) of anti-chlor (sodium bisulphite solution of 36° Tw), for 20 minutes cold. Finally a thorough washing with cold water is given. To give a soft finish to the goods a further treatment may be given with a dilute soap bath at about 160° F., and if a bluish-white bleach is desired a little bluing may be added to the soap bath.

Howell.

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MIXING GLUE AND VARNISH

Editor Textile World Record:

I would like to find a method of mixing glue and varnish for drawing and speeder rolls.

Dubon (1924).

It is customary to varnish the leather covering of draw frame, railway head and combing machinery rolls, with the object of providing a surface which will be smooth and pliable and at the same time preserve the leather. Although the rolls of fly frames and spinning machines are not mentioned above it will be in order to state that these are sometimes varnished to accommodate certain classes of work or atmospheric conditions. On the other hand there are good carders who never varnish even the draw-frame rolls, preferring to have them covered with the smooth side of the leather out and depending entirely upon this for a drawing surface. When rolls are to be varnished they are usually "buffed" or trued up on the surface with a grinding roll and in some cases a thin coat of gum senegal or gum arabic is applied before the varnish in order to preserve the leather.

With reference to the preparation of roll varnish for cotton mill use it must be remembered that the character of the leather will influence the results obtained by the varnish. For instance, a coarse grained leather may require a varnish having a heavy body in order to fill up the pores, while a leather of fine texture may require more of a surface varnish.

Generally speaking, the varnish should be made and applied to give an artificial drawing surface which will be almost as pliable as the leather; at the same time, it must not crack, dissolve or grind away into a powder.

A number of recipes will now be given,

each of which has been used, producing equally good results under certain conditions.

No. 1. Dissolve 1 lb. of pulverized glue in 1 qt. of acetic acid; add 1 qt. of water and 1/2 oz. of oil of origanum.

The above may be boiled and then the coloring added to bring almost to the consistency of ordinary paint. About 1/2 lb. of coloring may be needed and if more convenient oil of cloves may be used in place of origanum.

No. 2. Three oz. bluing, 1 oz. common glue, 1/2 oz. fish glue, 1/2 oz. gum arabic or gum senegal and 2 1/2 gills water. Allow the solution to simmer for one hour and then then add the color.

No. 3. This varnish should be made several days before using. Four oz. alcohol, 1 oz. gum arabic, 1 oz. common glue, 6 oz. Cooper's gelatine. Boil for one-half hour and then add 6 oz. of coloring and mix.

No. 4. Dissolve 1 lb. pulverized glue in 2 qts. of good vinegar; then add 1/2 oz. oil of cloves or oil of origanum and 8 to 10 ozs. of coloring. In this case the glue, vinegar and oil can be boiled for 15 minutes before adding color.

The coloring may be obtained by using any of the following in the powder: Vermillion, venetian red, chrome green, chrome yellow, chrome red, lamp black or ordinary bluing may be used; the object being to give body to varnish. If, after applying, the varnish should commence to crack, it may be advisable to use a little less glue in the next mixing; or if not very bad a little more oil of origanum or oil of cloves may be used. If the varnish wears off too quickly a little more glue may be added. Forfar.

REMOVING VARNISH FROM COTTON THREADS

Editor Textile World Record:

Can you give me a remedy for removing varnish from cotton threads, other than using caustic soda? Jacques (1927).

"Jacques" specifies that he does not wish to use caustic soda for this purpose, whereas on a large scale this agent would be the most practical, so we presume he has in mind the removal of varnish from small lots of cotton thread which have become accidentally stained thereby. In such a case I would recommend the treatment of the thread with turpentine and then scouring out well afterwards with warm water and soap.

Hertford.

To remove varnish from cotton threads or cotton waste, caustic soda solution is the best reagent to use, but if its use is objectionable, the varnish may be removed by boiling the material to be cleaned in a solution of soda ash of about 5 per cent. strength, that is, 5 pounds of soda ash dissolved in 12 1/2 gallons of water. The varnish should be completely removed after 1 to 2 hours' boil. Some varnishes, especially such as contain considerable quantities of shellac, require boiling with borax to cleanse them effectively. Small batches of cotton can be freed from dry varnish, especially turpentine-rosin varnish, by soaking in a mixture of denatured alcohol and ammonia, equal volumes.

Berwick.

SOAP FOR KNIT GOODS

Editor Textile World Record:

I am sending you two swatches of knit cloth. One is about 60 per cent. wool and wool stock, the rest cotton, and the other is all cotton. I am using a soap made of 50 pounds good palm oil soap, 75 pounds alkali, 180 gallons water, and am using 12 gallons to 90 to 100 pounds of goods. The goods are all right when they are first finished, but after being boxed and lying four or six weeks they smell oily. Waveland (1908).

The following is a good formula for making soap: Have two tanks, one for palm oil soap and one for olive oil soap or green soap. The tanks should hold about 90 gallons of water. Fill half full and add 60 pounds of palm oil soap and in the other tank add 60 pounds olive oil soap. Boil both solutions until they are well dissolved and then run up the tanks full of waters, adding 30 pounds ammoniated potash and boil for two hours when the soap is ready to use.

To treat 80 pounds of goods first use 6 gallons of palm oil soap, or 2 pailfuls of olive oil soap. It will be easy to get at the cost. One hundred pounds of goods is too much for any fulling mill to attempt to full at one

time. I have always had good results and there is no odor from the goods.

Howard.

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SPOT PROOFING

Editor Textile World Record:

What chemicals are used on cloth in the so-called "cravenette" process, or spot proofing that is so much in vogue at present? Troy (1914).

The questioner speaks as though "cravenette" and "spot-proof" were equivalent and interchangeable terms, but this is scarcely the case. The former process aims at something more than rendering fabrics spot-proof only. According to the advertisements of the owners of the trade-mark, cravenetting makes cloth "rain and weather resisting . . . permanently rainproof, water running off as from a duck's back." But in order to be spot-proof or "unspottable" a fabric need not turn water at all. The title is earned if water dropped and air-dried on the fabric fails to disturb the finish. The destruction of the luster by spots of rain or other splashes of water leaves marks or "spots" on highly finished wool goods and the finish is spot-proof when these do not show after drying. In ordinary circumstances cold water is implied but in some circumstances a finish luster proof against hot water is demanded. A fabric may be rainproof and not spot-proof or spot-proof but not rain-proof (i. e. repellant).

If lengthy particulars of the cravenette style of rainproofing are wanted, these may be found in the Textile World Record for April and May, 1907 and January and March, 1910. The chemical used is acetate of aluminium, formed by adding pure sulphate of alum to pure acetate of lead with or without addition of acetic acid. The details vary with the class of goods under treatment but the process consists fundamentally in impregnating the fabrics with acetate of alum and thereafter treating them with solid or melted wax or waxes. This treatment is sufficient to render a number of fabrics spot-proof but is not effective where a high luster is developed subsequently to the proofing operation.

Spot-proofing does not necessitate the use of chemicals. It requires simply the "setting" of the luster after the desired finish has been attained and the means taken are determined entirely by circumstances. There are finishes which are spot-proof without treatment at all; some which can be set by more or less prolonged roll-boiling; and others requiring the use of the decatizing machine. The latter has been the best friend of many producers of fine faced dress-suitings and costume cloths and is the recognized means of achieving the object. Dry steaming and rotary-pressing, repeated if need be, are the processes used by a large English concern in making dress goods proof against spotting and cockling. It is suspected, but is not certain, that the handle of the dress goods so treated is sometimes improved by addition of a little aniline oil. It is questionable whether satin-faced amazon cloths of the highest brilliancy ever are absolutely spot-proof, however they may have been treated, stamped or guaranteed. The raising or ruffing of the surface fibers, a mark behind.

A slightly different use of the term spot-proof has been sometimes made in connection with the cheapest sort of all wool French dress goods. These at one time were heavily sized to lend weight and firmness to the fabric and the effect of rain was to make cloth look as though it had been spotted with flour paste. Qualities free from this defect were warranted unspottable.

Wessex

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LACE YARN

Editor Textile World Record:

We would like to know which is the more profitable to use in the making of domestic cluny and mixed laces like sample enclosed, made on a 9 1/2 point go-through Spridgeon machine. The sample is 24 carriage width, 28 to 30 inches to a rack in quality and 48 to 54 bars. Two kinds of yarn are used, viz., 50/2 hard wet twist combed peeler like sample and a fine yarn. Please state whether 70/1, 140/2 or 180/2 is the more profitable and the minimum per cent. of waste. Manix (1929).

The inquiry has been put to the machine maker, J. W. Spridgeon, Ltd., Long Eaton (Eng.), and inquiries made by him indicate that 180/2 is the most economical yarn to use in laces like the sample. Although

dearer in first cost it is cheaper in the end as its use assists greatly in obtaining the maximum amount of racks. This opinion is that of several lace manufacturers using the machine.

The waste is reckoned per winding and the amount of waste in making lace like the sample should not exceed 1 to 1 1/4 pounds per machineful. Wessex.

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WATER FOR BLEACHING COTTON KNIT GOODS

Editor Textile World Record:

We are enclosing an analysis of water. Would this water be suitable for bleaching cotton knit goods? If not, how could it be treated to make it so.

Contains.	Grains per Gallon.
Silica	1.9244
Iron and Alumina	.1633
Sodium Chloride (Salt)	.2216
Sodium Sulphate	.6123
Potassium Sulphate	.3966
Calcium Carbonate (Carbonate of Lime)	2.2978
Magnesium Carbonate	.4082
Total Solids by Evaporation	6.1350

Matthew (1926).

In bleaching cotton knit goods it is advisable to use as pure a water as possible. The reason for this is not only to effect an economy in the use of the chemicals employed for the actual bleaching and boiling out processes, but also with an idea of obtaining a better quality of bleached fabric. The softer and cleaner the water used, the softer and cleaner will be the resulting cloth after bleaching. From the analysis of the water as given in the inquiry, I would say it would be classified as a moderately soft water, but from the fact that it contains quite an appreciable quantity of iron, it is liable to give trouble in boiling out and bleaching. If the iron were removed and the water also properly softened, it would be very good to use in bleaching. While it could be used untreated and perhaps quite satisfactory results obtained, if the knit goods are bleached on the open run, nevertheless, I would recommend that the water be filtered. The best kind of filter to employ for this purpose would be a sand-pressure filter provided with an alum cell so that the iron could be completely removed as the water passes through the filter. Such filters can be obtained from specialists in this line of work like Hungerford & Terry, or Wm. B. Scaife & Co. Before the prospective manufacturer decides definitely on this matter it would be best for him to take the advice of a suitable consulting chemist experienced in the matter of bleaching cotton goods. Howell.

A sample of water shows upon analysis to contain

	Grains per Gallon.
Silicia	1.9244
Iron and Alumina	.1633
Sodium Chloride	.2216
Sodium Sulphate	.6123
Potassium Sulphate	.3966
Calcium Carbonate	2.2978
Magnesium Carbonate	.4082

Total solids of evaporation 6.1350

This water is not unsuited for hosiery bleaching provided the quantity of iron present does not materially increase. The figure (.1633) given in the analysis is for both "iron and alumina," with the presumption in favor of the alumina predominating, in which case no serious results will be had. The analysis shows that the "hardness" of the water is about 3 1/2°, which is comparatively low, and which could hardly be improved to advantage.

The iron can be practically removed by aerating the water, that is, arranging a sort of fountain or spray so that the water in fine particles come in contact with the air which then oxidizes the iron to the insoluble ferric state, when it is removed by sand or other form of filtration.

A simple means exists for purifying water by the quick adding of chemicals. The commonest water purifying system is based upon the use of caustic soda and milk of lime, both in very small quantities calculated upon a number of analyses, and which cause a most complete removal of dissolved impurities, including iron, which is the most objectionable impurity from the bleachers' point of view.

Beta Naphthol.

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There are in Russia 20,717 factors, which employ 1,671,087 people, of whom 399,900 are engaged in the textile trades.

Knitting Department

KNIT GOODS SITUATION

The past month has been a busy one for all interests in the knit underwear end of the business. There have been more buyers in the market during the month of July than in any one month in previous years, and although it is quite certain that the amount of business placed has fallen short of that of the past two or three years, yet many manufacturers and agents state they are well satisfied to let the sale of the balance of the production wait until later, as it is believed that they expect to get better prices then. On the other hand, there has been a softening up of the prices of men's balbriggans during the past year which would indicate that some manufacturers of this class of goods are on the anxious seat to some extent and are endeavoring to force business by making low prices, considered by many unwarranted. Some of the lines of balbriggans quoted early at $1.75 have been reduced to $1.70 and there have been rumors going about that some orders have been taken as low as $1.65 and $1.67 1/2 for goods running four pounds in weight, and the five pound goods opened at $2.00 have been reduced to $1.90.

The production of men's 25 cent balbriggans has increased largely during the past two or three years and there are so many mills making this class of goods today, that buyers are not obliged to hurry to cover their requirements, consequently, manufacturers are liable to begin cutting when the orders do not come in as fast as anticipated.

Ladies' straight ribbed vests are being sold at practically last year's prices and in some instances, 2 1/2 cents a dozen less. A full taped garment of fair quality can now be had at 60 cents a dozen for ordinary sizes, and plain trimmed extra sizes in both 2 by 2 and Richelieu ribs are being offered at 75 cents quite generally. Plain trimmed single thread lisle vests are being shown at $1.55, and mercerized at $1.80 and $1.85 are being offered by a few manufacturers.

All through the lines of straight ribbed vests, it is noticed that buyers are selecting principally those styles that are without fancy edgings or fancy yokes when buying any quantities, but make up their line by buying a case or two of a great number of fancy styles to make up an assortment. Those made on Swiss machinery and the 2 and 2 ribs are the patterns that are taken to a large extent, except in the South and Southwest, where there is some demand for the Richelieu rib.

Several manufacturers are showing straight vests made of plain stitch cloth. These have the advantage of looking finer and wider than the 2 and 2 or Swiss ribs, but so far we cannot find that buyers have placed orders on these to any extent.

Among the newer fancy trimmed vests shown by Erstling Brothers is one made with linen crocheted yoke which appeals to some trade strongly.

The Scharadin Knitting Co. have been offering quite an extensive line of fancy trimmed vests in combed lisle thread yarns at $1.70 up to $3.50, and we understand that buyers have placed orders quite freely on these lines.

Quite an increase in the number of manufacturers making combination suits is noticed this season and a large variety of 50 cent suits is being shown in tuck and plain stitches, as well as 2 and 2 rib, and mesh fabric. A very sightly carded yarn tuck suit with torchon lace trimming at the knees may be had as low as $2.60, and plain stitches are offered freely at $3.00 per dozen, and some good qualities of combed yarn suits with very attractive assortment of laces are shown at $3.50. Buyers generally are purchasing more Swiss ribbed suits than in former seasons, and it is also noticed that there is an increasing demand for suits made with tight fitting knee at the expense of those trimmed with lace.

The Hirsh Knitting Mills of Philadelphia are now confining their entire attention to

making the Nushape and in a variety of grades from $4.00 to $10.50. This mill uses only lisle thread and mercerized yarns and their lisle thread suit at $4.00 per dozen is one on which the production is usually sold up early in the season.

It seems as if every manufacturer of men's underwear is showing a mesh garment of some sort for 1912. Although we cannot learn that many of them are taking any great volume of business, yet the aggregate sale of meshes must cut into the balbriggan production. Some lines of men's mesh shirts and drawers are being offered as low as $1.75. One manufacturer is showing a line which he is circularizing and describing as an exact finish of the genuine Porosknit at $1.80.

An increasing business is being done on boys' combination suits made of mesh cloth at $1.90, and mesh suits for ladies at $3.62 1/2 to $3.75 are meeting with ready sale.

The Cooper Underwear Co. of Kenosha, Wis., are introducing a men's combination garment which appears to have some decided advantages. It is made with a seat that remains closed, regardless of the position of the wearer. The opening down the front stops near the crotch and the seat flap is closed with a single button. These are made in a variety of qualities and are meeting with ready sale.

The B. V. D. line of nainsook underwear is being shown at the same prices as for the past season and the manufacturers of this line have already booked a large portion of their production for the coming year. Their orders so far taken do not show a greatly increased demand for shirts and drawers, but the sale for combination suits made of nainsook has increased by leaps and bounds during the past year.

Nelke & Co. of Philadelphia have applied for a patent on a boy's garment made of knit fabric called the boy's Scout union suit. The particular advantage claimed for it is the ease and rapidity with which it can be put on or taken off. It closes with two buttons on the shoulder and this garment is made principally in sleeveless and knee length style.

Business on fall lines has been very slack during the past month. So far as we can learn, retailers have not been placing any orders with jobbers, and of all the buyers for the large jobbing houses who have been in the market recently, scarcely any of them have shown any interest in placing duplicate business on heavy weights.

In last month's report, we mentioned that A. S. Haight & Co. were offering a 5-lb. balbriggan garment of combed yarn and a 6-lb. garment of carded yarn, at $3.50. We are informed that both of these garments are made from combed yarn. The 5-lb. is a genuine combed Egyptian and the 6-lb. is a combed stained Egyptian, both shirts the product of the Lebanon Mills. In addition, they are offering a Sea Island garment at $3.50 which is excellent value.

HOSIERY

Last month witnessed the placing on the books of a good volume of business for 1912 at prices corresponding closely with those made last year. The orders are, as a rule, smaller than those placed for 1911 and with some mills only represent about 60 to 70 per cent. of their output. Nevertheless, they were placed without much quibbling about price and there seems to be a feeling with most of the sellers that it will be necessary for the buyers to come into the market for duplicates at an early date.

The fact that impresses the buyer most in going about the market, is that it is decidedly a silk hosiery season, and at the same time, the past two weeks has shown a very active business in low priced hosiery of all kinds.

A great many buyers from the South and Southwest have been in the market and as they have placed orders freely, it has had the effect of making 10 cent and 15 cent hose quite active and in this low end, fancies are being shown in great profusion, embroidered, two toned and extracts, and the orders placed by jobbers so far show an inclination on the part of jobbers to encourage the fancy end of the business.

Some very attractive jacquard effects are shown to retail at 25 cents a pair, and the lower end goods comprise polka dots, stripes and figures on almost every old shade of background, although the most prominent

are pearl grey, light tan, copenhagen blue and helio.

Among the new offerings in ladies' hose that have attracted considerable attention is a silk boot stocking being offered by Chipman at $1.85. Of course, the length of silk boot is not long, but there is enough of it to satisfy the trade who look for a silk stocking at 25 cents for at least a trial. It is not expected that the sale of 25 cent silk hosiery will interfere for any great length of time with cotton goods, because there is so little wear to the former, and it is believed that the trade will appreciate after a short trial the disadvantage of buying 25 cent silk hose.

Silk hosiery to sell at 35 cents has sold largely and one agent states that he believes there are ten cases of silks booked for 1912 against one case of cotton. At fifty cents, there is really little else sold, except silks, and fine gauge lisles and cottons so popular a year ago are going begging for business. It is now possible to furnish full fashioned silk stockings as low as $3.65 and at this price the quality is good enough to cause buyers to look upon the line as good value for the consumer.

ANALYSIS OF KNITTED FABRICS

BY LAFAYETTE

Manufacturers of hosiery, and also of underwear, are frequently asked by their selling agents to duplicate a stocking or an undershirt, and numerous trials and experiments are made before the exact fabric of the same gauge and weight per dozen is obtained.

In hosiery it is much easier to analyze a stocking and ascertain how many needles were in the cylinder on which it was made, and the size or number of the yarn used, as the stitches can readily be counted and the yarn weighed.

In the case of ladies' seamless hosiery, the only point that cannot be positively determined is whether the cylinder used was a 3 3/4-inch diameter or a 4-inch. Some manufacturers use the former size, and others the latter. The gauge of the stocking is almost identical in both cases, thus making it very difficult to say on which size the stocking was made.

Again, the builders of hosiery circular machines have different ways of measuring their needle cylinders. Some measure them by taking the outside circle of the needle cylinder, others take the measurement from back to back of the latch needles when in the cylinder, and call that the diameter of the machine.

It will be thus seen that by the latter method a 3 3/4-inch machine will be practically the same as the 4-inch diameter measured the former way.

Those who have adopted the latter method say that the depth of the slots cut in the cylinder should be deducted from the diameter of the cylinder, thus leaving the calculation of the number of needles to the inch of the circumference to be more accurately ascertained.

In underwear the most difficult point to determine is the gauge on which the garment was made. The reason for this is that by using a finer yarn, say on a 26 gauge, and finer needles than 26-gauge needles, the gauge can be made to look as fine as 28 or even 30 gauge, on which the yarn used had been as heavy as the last mentioned gauge would permit.

The weight of the goods made on 30 gauge, with a heavy or coarse yarn for the gauge, would be heavier than that made on the 26 gauge with a finer yarn for the gauge, and that made on the 26 gauge would look as fine in the gauge as that made on the 30 gauge.

To demonstrate further this difficulty of determining the gauge, would say, I have known cloth to be made on 22 gauge that looked as fine as that made on 26 gauge, and the weight per dozen of goods was exactly the same. This was accomplished by taking the 26-gauge needles and casting them in the 22-gauge mould. In order to have the cloth the same width as the 26 gauge, a cylinder 2 or 3 inches larger in diameter was selected, or one that would contain about the same number of needles in 22 gauge as was in the 26-gauge cylinder, and in drying the cloth, it was dried the same width as the 26-gauge

cloth. Yarn of the same size was used on the 22 gauge as on the 26 gauge, and the knitted cloth was identically the same as to the appearance of the gauge, and also as to the weight.

It follows, therefore, that to duplicate a knitted shirt so as to get the same gauge and the same weight per dozen, the first thing to ascertain is the number of needles around the shirt, next its width, and next the number of the yarn used, and lastly, the number of stitches per square inch, which can be counted by the use of a magnifying "stitch" glass. This "stitch" glass is the same as the "pick counter" used by weavers for counting threads to the inch on woven goods. They are made 1/4, 1/2 and 1 inch square.

Even after the number of needles and the size of yarn used have been ascertained, the most important point, in order to produce the same weight per dozen of goods, is the "stitch," or the number of stitches per square inch, as the more stitches to the square inch, with the same number of yarn, the heavier the goods per dozen will be.

Again, the stitch in a ladies' seamless stocking is made shorter, and more stitches to the square inch are inserted in the ankle and foot part than in the upper part of the leg. As the stitch in full automatic hosiery machines is automatically shortened for the ankle and foot, this is the best place to ascertain the number of stitches per square inch. This shortening of the stitch in the ankle part is done for the purpose of making it narrower at that part, and thus helping to shape a seamless stocking.

In full fashioned hosiery, the stitch is not shortened, but remains the same, the stocking being narrowed on the machine, on each side of the selvage edges, from the lower end of the calf down to the ankle, hence the term full fashioned.

To duplicate a stocking, measure carefully the length of leg, including heel, and also length of foot.

Then count the number of stitches to the square inch, both vertically and horizontally, through the magnifying stitch glass.

Next count the number of stitches around the stocking, which will give the number of needles in the cylinder.

Next, cut off enough of the leg of the stocking and proceed to unravel same, and wind for 120 yards on a yarn reel, being careful to have sufficient tension on the unraveled yarn in winding it on the reel, to take out the kink or curl made in the yarn in knitting.

This 120 yards of yarn is then weighed on a grain scale.

Now divide 1,000 by the weight in grains and the quotient will be the number of yarn by the cotton system.

For example, if the weight is 50 grains, the number of cotton yarn is (1,000 ÷ 50 =) 20s.

If worsted yarn, divide 1,500 by the number of grains. In the above example the count by the worsted system would be (1,500 ÷ 50 =) 30s.

Thus, if a manufacturer is using a number 20s cotton yarn, and desires to make the same weight of stocking in worsted yarn, he would use a 30s worsted yarn.

Take another example, in which the weight of 120 yards is 83 grains, 1,000 ÷ 83 = No. 18 cotton.

To duplicate an undershirt, measure carefully the width and length of body, also length of sleeves and cuffs. Then count the stitches in the circumference to determine the gauge. Multiply the width of the shirt in inches as measured across the double fold by 3 1/7, to find the circumferences of the circular fabric. Divide the number of stitches by the number of inches thus obtained and multiply the quotient by 1 1/2 to determine the gauge, which is the number of stitches in 1 1/2 inches.

For example, we will say an undershirt which is called and marked 40 inch should measure 40 inches around, or as measured on the double fold 20 inches in width. This measure across usually represents the diameter of the cylinder on which the shirt was made, therefore, the circumference is equal to 20 × 3 1/7 = 62 6/7 inches.

There are about 1,000 stitches in the circumference. 1,000 ÷ 62 6/7 = 16. 16 × 1 1/2 = 24 gauge.

Take another example: 44-inch shirt measures 22 inches across. 22 × 3 1/7 = 69 1/7. The number of needles is about 1,014. 1,014 ÷ 69 = 14 2/3. 14 2/3 × 1 1/2 = 22 gauge.

The number of the yarn is ascertained in the same manner as with hosiery, by unraveling, and reeling off 120 yards, and finding its weight in grains.

Having ascertained as nearly as possible the gauge and the number of yarn, use the size of cylinder that will contain the number of needles of the indicated gauge. As in the hosiery, have the same number of stitches per square inch as shown by the use of the magnifying stitch glass, and the shirt will be duplicated as to gauge and also as to the weight of the goods per dozen.

Different weights of goods can be made on the same gauge, with the same number of yarn, and the same number of stitches, by making the stitch longer or shorter. This shows that the question of "stitch" in knitting is very important as regards weights.

In plated hosiery or underwear made of cotton and worsted yarn the size of each kind of yarn is ascertained in the manner already explained. The percentage of each kind of material can then be readily calculated. For example, if the cotton number used is 20s and the worsted number 30s, these two being equal in weight and size, there would be 50 per cent. of each material. If the cotton number is 20s, and the worsted number 18s, there would be 62 1/2 per cent. worsted and 37 1/2 per cent. cotton.

AN ATTACHMENT FOR CIRCULAR KNITTING MACHINES

This attachment, recently patented in the United States, provides means by which the cylinder is held up, keeping the stitch over the needle latch when the transferring takes place. Fig. 1 is a side view showing the attachment mounted on the post of a circular knitting machine with the hinged arm of the latch ring in raised position. Fig. 2 shows the latch ring and needle cylinder in lowered position. Fig. 3 shows the upper rear end of the post. Fig. 4 shows the rear end of the arm of the latch ring. Fig. 5 is a perspective drawing of the latch and its mounting detached from the post. The attachment is secured on the upper end of the post. It consists of a small rectangular plate secured to the upper end of the post by means of a pin and screws. Mounted on a logitudinal recess in the side of the plate is a slidable latch having an oblong slot in its upper edge, which is in alinement with a slot or cut-away portion in the upper edge of the plate. A depending lever is secured to an arm of the latch ring, the arm being pivoted to the plate by means of a depending projection engag-

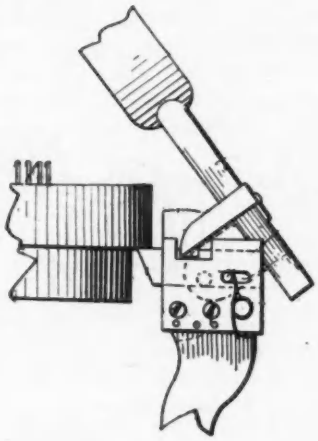


FIG. 1.

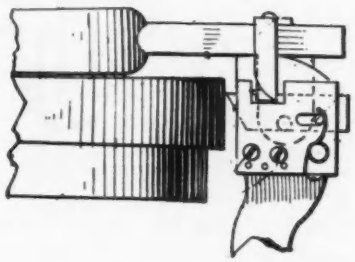


FIG. 2.

ing the pivot pin mounted in the upper end of the post.

The latch is provided with a pin which projects through a slot in the side of the plate, and has engaged therewith a spring which serves to move the latch forward. The lower end of the tripping lever projects into the notch of the latch and holds it in retracted position against the tension of the spring, as shown in Fig. 2. The lower end of the lever is curved in order to permit the necessary play of the lower end in the slot.

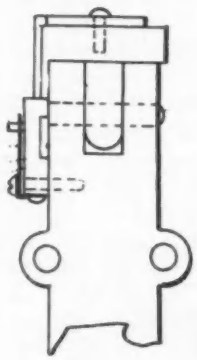
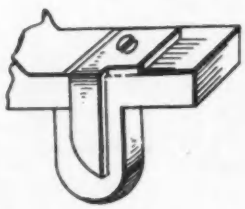


FIG. 3.



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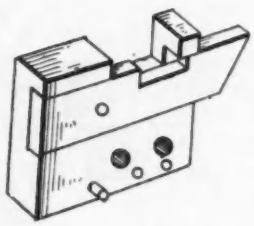

FIG. 5.

By means of this attachment, when the needle cylinder is raised and work is to be transferred, the latch ring being also raised will cause the lower end of the tripper lever to be moved forward in the slot, thereby releasing the latch from locked position and permitting the spring, which is normally held under tension, to move the latch forward beneath the sinker guide ring on the needle cylinder and hold the needle cylinder in raised position, as shown in Fig. 1. When the latch ring is lowered, the lower end of the tripping lever will be moved back in the slot and, engaging the rear end of the slot, will move the latch back out of engagement with the sinker guide ring on the needle cylinder and into its normal retracted position with the spring held under tension.

The attachment, which is shown as placed on the hinged arm of the latch ring, may be changed from the back post to the front post, by detaching the plate. By means of this invention the dropping of stitches will be avoided, as well as loss through the carelessness of the operator of the machine.

DEPRECIATION OF MACHINERY IN A KNITTING MILL

BY RARITAN

The depreciation of machinery in a knitting mill and the percentage that should be allowed annually depends a good deal on the class of machinery, on the employes whose work it is to keep the different machines in repair and working order, and also on the ideas and views of the proprietors of the mills. Certain classes of machines depreciate in value more rapidly than others owing to the radical improvements being made on them from time to time, which render the older machines absolutely worthless. Again the value of other machines in which only slight improvements are made can be maintained unimpaired by adding these improvements.

In the last twenty-five years hosiery machines have depreciated in value more rapidly than other classes of knitting machinery owing to the rapid and radical improvements. Twenty years ago we had what was called the hand stocking machine that was considered remarkable in its line. It was operated entirely by hand power. The first improvement on these was to add machine power for knitting the leg part of the stocking. This

improvement caused the first machines to be practically worthless, as they could not be adapted to power. A new machine had to be built and whereas it required an operator to each hand machine one girl could attend to two or three power machines. Improvements have been made very rapidly from the old hand machine to the 1/2, 3/4, 7/8, 15/16, and finally to the full automatic machine of today. These are operated entirely by machine power and require only a slight supervision and to be kept supplied with yarn.

Each stage in the development has been marked by sudden depreciation in the value of the older machines. Even now that these machines have reached the full automatic stage, improvements are still going on so as to make them more durable, or less liable to get out of order, or to save wear and tear on the needles. On this class of machines a manufacturer should deduct at least 10 per cent. annually so as to wipe out the cost in ten years.

Spring needle knitting machines depreciate very little. While there has been quite a number of improvements on this class of machines in the last twenty years, still they have been in the nature of improved parts, and the construction is such that an old part could be removed and the new improved part put in its place. A manufacturer who has kept abreast of the times and purchased these improved parts from time to time, and replaced with new parts those which wear, has today practically up-to-date machines, which are just as good for manufacturing purposes as a bran new machine made at the present time.

I have known spring needle machines, twenty years old, which had keen kept in thorough repair and condition, to be sold for 75 per cent. of the original cost.

Manufacturers who have this class of machines and who see that they are kept in good condition, will not need to allow more than 3 per cent. annually for depreciation. All new or improved parts that have replaced others are charged to "repairs" account, which is quite proper, as the new improved parts do not add to the cost value of the machine, only so far as they prevent the value depreciating.

Certain makes of sewing machines are another class of machine that do not depreciate very rapidly provided new parts are constantly procured to replace the worn out parts.

There are some manufacturers, however, who boast of their repair account being small, because when a part breaks or is worn considerably, instead of buying a new part, the fixer is told to patch it up so it will run, which he does, with the result that in a few years the machine is of no value except to be thrown out for old iron. It is false economy to patch up a broken part of a machine. Fixers often remark, "Well, I patched up that all right and it is stronger than before." Yes, no doubt that is true, but I have found from experience in the running of machines this way, that the fixed up part, which is now stronger, will cause the breaking of another part, which would not have broken had a new part been put in instead of patching up the broken one.

This principle applies to nearly all kinds of machinery, and it may be stated generally that it does not pay to patch the machine, but that it is cheaper and better in the end to replace all broken and worn out parts with new ones and in this way keep up the condition and value of the machine. Take sewing machines as a whole. I think 5 per cent. annually is sufficient to cover depreciation.

Cop winders depreciate very little. The chain parts and the shaft boxes are the parts that wear out first and these are easily replaced with new. Then the spindle sockets and bearings are other parts that wear, causing the spindles to run untrue. Still good bobbins can be wound, even when these are considerably worn with long use, so that 5 per cent. annually would be ample to allow for the depreciation of this class.

Washing machinery depreciates rapidly from the rotting of the wood as well as from greatly improved labor saving machines that are being brought out from time to time, so that for this class not less than 10 per cent. should be allowed annually.

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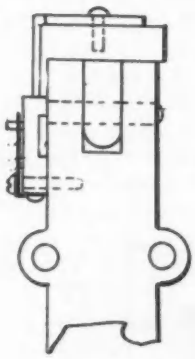


FIG. 3.

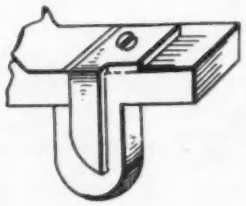
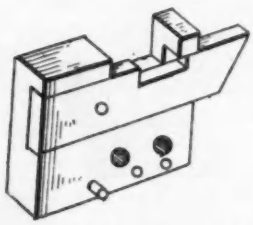


FIG. 4.



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Washing machinery depreciates rapidly from the rotting of the wood as well as from greatly improved labor saving machines that are being brought out from time to time, so that for this class not less than 10 per cent. should be allowed annually.

Generally speaking, therefore, the depreciation of machinery depends upon whether the machines have been rapidly improved or not and also whether they have been continually kept in good repair and in good working condition.

Of the total supply of cotton for the six months ending February, 1911, amounting to 12,788,772 bales, 2,402,232 bales, or 19 per cent., were consumed in the United States, and 6,338,468 bales, or 49 per cent., were exported, while 4,048,072 bales, or 32 per cent., remained in this country at the close of the period.

A STOP MOTION FOR KNITTING MACHINES

This stop motion is adapted for circular knitting machines on which an extra bobbin is used to carry a reinforcing thread. There is a belt shifter or brake to be brought into operation in case the reinforcing yarn breaks. Fig. 1 shows the rear elevation of a knitting machine with the improved stop motion. Fig. 2 is a plan of the same machine. Fig. 3 is a separate view of the device. The cop, as shown, is composed of the yarn intended to be knit in at the knee or other point where reinforcing is required. When the machine is used for work where

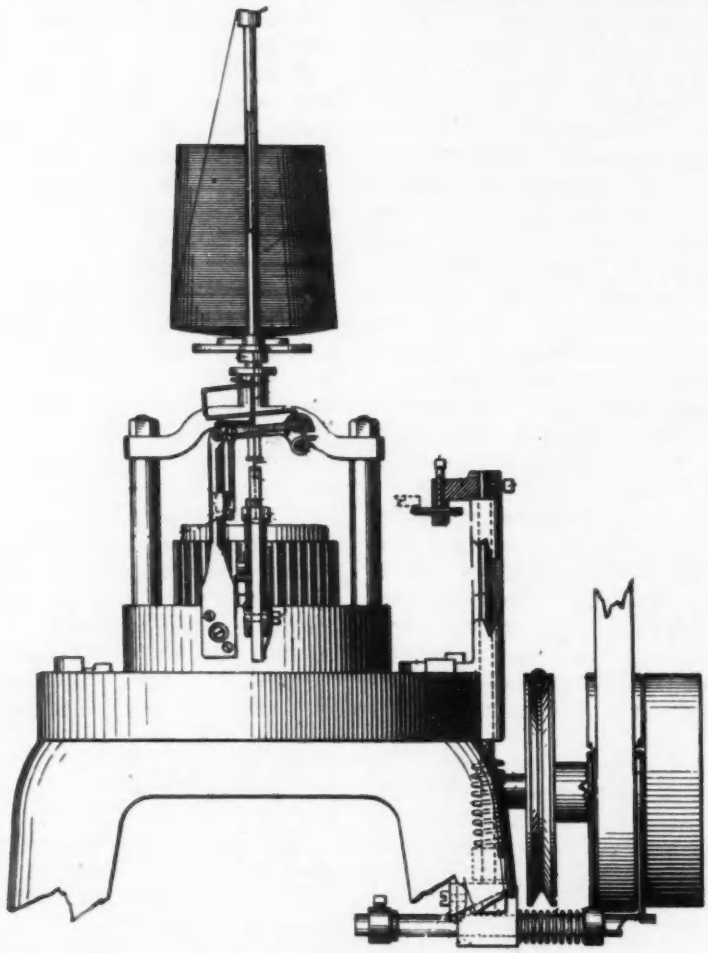

FIG. 1.

reinforcing is unnecessary the bracket and its working parts may be detached from the rotary head of the machine. When in operation the yarn is led from the cop through the guide and through the tubular post, in front of the frame through the hook and through an eye, on the bracket, thence it passes through the guide or eye on the lever and between the noses of the jaws, through the yarn carrier (not shown) to the needles.

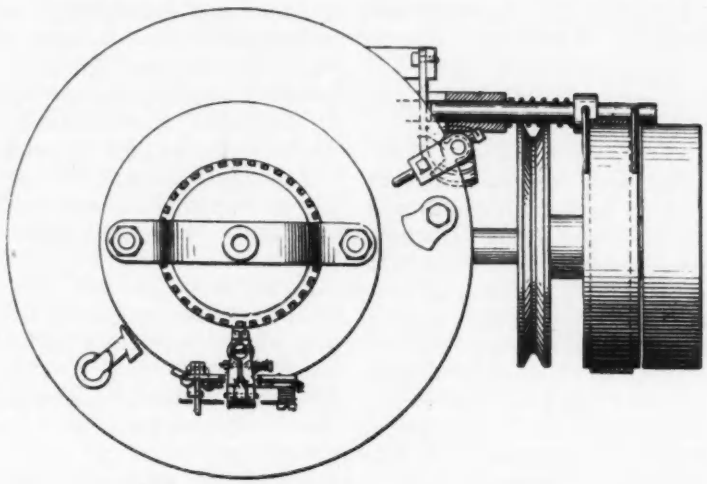

FIG. 2.

FIG. 3.

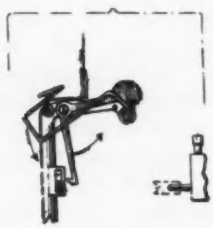

FIG 4.

It is obvious that if the yarn parts, the hook will no longer be supported and that the coil will turn in the direction of the arrow, Fig. 3. The movement of the lug, 14, will raise the weighted end of the lever, as shown in Fig. 4, disengaging the hook from beneath the bar, permitting the bar to drop to the bottom of the slot. As shown in dotted lines, Fig. 1, the bar rotates in a plane immediately above the pin carried by the vertical rod; as shown in Fig. 4, the bar when released by the hook drops into the path of the pin and acts to give the rod a partial rotation. The cam at the foot of the rod then acts through the lever to release any well known latch mechanism. The latch coacts with the slot, which latter is suitably located on the rod. The rod is released so that by the force of the spring the belt is shifted to the loose pulley, stopping the machine.

The quantity of cotton imported into the United States during the six months' period ending February, 1911, was 68,369,910 pounds, equivalent to 136,740 bales of 500 pounds each, and valued at $15,241,680.

The total exports of linen goods from the United Kingdom in 1910 aggregated over $46,000,000. Of the $30,000,000 linen piece goods exported, a little over one-half was sold in the United States.

Dyeing, Bleaching, Finishing, Etc.

THE AFTER TREATMENT OF SUBSTANTIVE DYES ON COTTON

BY THOMAS FORSYTH

Winner of the Textile World Record Gold Metal at the Philadelphia Textile School.

(Continued from July.)

The supposition that after treatment with copper sulphate is of limited effect only and becomes neutralized on washing is erroneous. Changes on washing were noticed in the case of the earlier diamine colors, but it was found that free alkali was the cause of all the trouble. Any good neutral soap may be used on copper treated dyeings without removing the beneficial effects of the metal. Sulphuric and oxalic acids are found to neutralize the effects of copper sulphate, but acetic acid is without action in this respect. In the finishing of after treated goods, it is found that only the alkaline finishes reduce the fastness to light, while the ordinary methods of finishing rather improve the quality in this respect.

As stated above, all substantive colors are not suitable for after treatment with salts of copper, some because they show no change in fastness to light or washing, and others because they are altered too much in shade. The following notes are the result of a series of laboratory tests and will serve to explain the effect of copper sulphate on some of the common dyestuffs of this class:

Diamine Fast Red F, one of the fastest of diamine colors in respect to light, is rendered even faster when treated with copper sulphate. The shade is only slightly dulled at 150° F. At the boil, the fastness to washing is also increased, but the shade is altered more.

Diamine Orange B. The shade becomes more of a brown and is much faster to light.

Diamine Yellow N becomes somewhat redder and more permanent against light.

Diamine Jet Blacks turn very red, but are greatly improved in fastness to light and milling. The change in shade, however, is too great to allow of this treatment.

Diamine Brilliant Blue G is rendered only slightly duller and is made much faster to light and washing. If desired, a higher temperature may be used with this color.

Thioflavine S is not affected either in shade or fastness by any after treatment.

Diamine Blue 3 R becomes more violet, but gains considerably in fastness to light.

Diamine Fast Blue C G is not benefited to any extent.

A few of the dyestuffs, beside those given, which are not too greatly changed in shade and whose fastness to light is substantially increased are Pluto Orange G, Brilliant Azurine, Chrysamine G and R, Diamine Blue R W, Benzo Blue, Benzo Copper Blue, Benzo Azurines.

There are many more substantive dyes equally suitable for after treatment with copper salts, but a complete list would require too much space. Those named, however, are especially adapted to this treatment and illustrate well the subject in hand.

Copper sulphate is not always used alone, but is often applied in conjunction with chrome. This treatment is a very important one and will be considered later.

SALTS OF CHROMIUM

All the salts of chromium oxid are available for after treating, but owing to the cost and lack of stability of most of them, the only ones that are used extensively are sodium and potassium bichromates, chrome alum and chromium fluoride. Wherever potassium bichromate can be used, the sodium salt is also of value, but it is not largely used because it is quite deliquescent and is usually less pure than potassium bichromate. It is of growing importance, however, as it contains a higher percentage of the desired oxid and is cheaper than the potassium salt.

Chromium fluoride and chrome alum have the property of forming lakes fast to washing just as the bichromates have, but on account of their higher cost, etc., they are used only where the oxidizing action of bichromates impairs the shade of the dyed material.

Chromium fluoride has the disadvantage of liberating hydrofluoric acid which is very corrosive, but this is often overlooked on account of the excellent results often obtainable by the use of this salt. The fluoride is largely used on substantive greens, but dyes of other colors as well are often benefited by its action. It may be used in conjunction with any of the direct colors, for, although all of them are not increased in fastness by its use, none of them are injured by it.

Chrome alum is very soluble in hot or cold water, this being a point in its favor over the fluoride, as the latter is not very soluble in cold water. Again, by the use of chrome alum, the evolution of hydrofluoric acid is avoided, but, as it contains much less chromium oxid than the fluoride, it is not used to any great extent.

The object in after treating substantive dyes with salts of chromium is to increase the fastness to washing, water and bleeding into white. The chromium lakes formed are no faster to light than the dyestuff itself, but dyed material which is to be washed is greatly benefited by this operation.

Potassium bichromate is the compound of this metal that is most extensively used. It may be applied at 170° to 212° F., usually at the latter temperature, for 15 minutes. Material to be thus after treated with chrome or other salts of chromium should be dyed in a neutral bath to avoid the precipitation of the oxid in the bath. This bath should contain about the same amount of acetic acid as chromium salt to prevent precipitation and the too rapid action of the salt. The bath must always be kept clear with a small amount of acid.

Chromium fluorid, chrome alum, and other compounds of the metal are applied in the same general manner as chrome. According to the depth of shade, it is found that the best results are obtained with 3 to 4 per cent. chlorid of chrome at 32° Tw., or 3 to 4 per cent. chromium fluorid and 1 1/2 per cent. acetic acid or 4 to 5 per cent. chrome alum.

The treatment may be carried out for 15 minutes at 140° to 212° F., but usually the latter temperature is applied as the shades are not affected.

Generally speaking, for each pound of color supposed to be on the fiber, one pound of fluoride of chrome should be used. The effect of after treating with this salt is shown by the results of the following experiments:

Diamine Fast Red F is greatly improved in its washing qualities and bleeds less into white. The fastness to light is slightly inferior to that before the after treatment, however. This color, so treated, is the best known substitute for Camwood in the dyeing of cotton warps for plush backings.

Diamine Bronze G becomes faster to washing and milling even in heavy shades, and no bleeding into white is noticeable.

Diamine Browns B and M are rendered much faster to washing and milling as are Diamine Yellow N, Diamine Green G, the Diamine Catechines and the Diamine Jet Blacks.

Chrome alum is suitable to use instead of the fluoride for fastening the above colors. In case it is desired to shade the dyeings with other colors, any of the substantive class may be used as the shades are not affected by the process.

Where the use of chrome is allowable, the material is worked for 15 minutes in a solution containing 3 to 4 per cent. of chrome and 3 per cent. acetic acid at 170° to 212° F. Excellent results are thus obtainable in many cases in respect to the fastening of the shades to washing, milling, bleeding and acids. This is especially noticeable in the case of Diamine Jet Black S S. Five to 6 per cent. dyeings of this coloring matter are largely used by thread makers and when after treated for 15 minutes with 4 per cent. of chrome, a black excelling logwood black in many respects is obtained.

The following are only a few of the colors which may be used in conjunction with chrome and in every case the fastness to washing, milling, perspiration and bleeding into white is substantially increased: Chrysamine G, Toluylene Orange G, Benzo Indigo Blue, Benzo Chrome Blacks B and M, Pluto Blacks C and C R, Oxamine Red, Diamine Brown B, Diamine Brown M, Diamine Yel-

low N. Diamine Green G, Pluto Orange, Cupranil Brown.

Chrome also tends to preserve the material and shades when the goods are stored. It is a noticeable fact that neither chrome nor bluestone fastens substantive dyeings to both light and washing. In order to obtain such a result, it is customary to employ a mixture of equal parts of each salt and the required acid. For medium shades, the best results are obtained by using 1 1/2 per cent. chrome, 1 1/2 per cent. bluestone and 3 per cent. acetic acid, or 2 per cent. sulphuric acid. The operation is conducted at temperatures ranging from 140° to 212° F. for 15 to 30 minutes. The material is then washed and finished as usual. This method, when applied to colors that are suitable to use with either chrome or bluestone, gives excellent results, as the dyeings are fastened in many cases to light, washing, milling, perspiration, hot pressing and storing.

Another method that has met with some success is the use of chrome in conjunction with formaldehyde. The dyed material is treated with a solution of 1 to 3 per cent. of formaldehyde and 1/2 to 1 per cent. of chrome for half an hour at 160° F., then washed and dried. Fastness to washing and increased resistance to the action of light are obtained.

It may not always be necessary, in order to meet the requirements of the trade, to make use of both chrome and bluestone in after treating, but when the product must stand tests for fastness to light, washing, milling, perspiration, hot pressing, acids and bleeding into white, both salts should be used. The effect of this combination may be seen with the following substantive colors:

Diamine Yellow N. Shade becomes redder and fuller. Much faster to light and washing.

Diamine Change B is affected the same as the above.

Diamine Browns B and M. Shades become somewhat deeper and duller and much faster to light and washing.

Diamine Brown R like Browns B and M. but to a less degree.

Diamine Catechines are rendered much faster to light and washing, while the shade is but little altered.

Diamine Grey G is greatly improved in fastness. Others whose shades are not seriously altered and whose fastness is considerably increased by this treatment are: Benzo Chrome Blacks B and N, Benzo Chrome Blue Black, Cupranil Black, Direct Deep Blacks, Benzo Chrome Brown, Catechu Brown, Cupranil Brown, Pluto Orange, Chrysamine G and R.

SALTS OF ALUMINIUM

Compounds of this metal are frequently used to render direct dyeings faster to washing, and it may be said that the salts of aluminium increase the fastness of all direct dyeings to washing, water and steam to a greater or less extent, even though no lake be formed. The effect is similar to that obtained by the use of chromium salts, and it has been stated that a mixture of chrome and alum is better for increasing the fastness to washing than either salt alone. This appears to be correct, according to laboratory tests, but just why this should be the case has not been explained.

Alum is the best salt of this metal to use because of its uniformity and suitable nature. Sulphate of alumina is usually too acid and is of less value than alum for general purposes. It however contains more of the desired oxid than does alum, 100 parts of the former being equivalent to 150 parts of the latter.

Acetate of Alumina is very good for after treating purposes, but, as it is not stable, it is customary to make it in solution from sulphate of alumina and lead acetate where it is to be used. To avoid the trouble of making the acetate, it is customary to use alum in most places, either the potassium or the ammonium salt, there being no perceptible difference in their action.

The best results with alum as an after-treating material are obtained by the use of 2 to 4 per cent. of the salt, no acid being required except in old baths, when a little sulphuric may be added to clear the solution. Should mixtures of chrome and alum be used, 1 1/2 per cent. of each will give the

best results. The temperature may vary from 170° to 212° F., as the shades are seldom affected by the higher temperature.

SALTS OF NICKEL AND COBALT

Compounds of these metals are similar in action to copper sulphate, but their action is less pronounced. Their cost is prohibitive, and a somewhat larger percentage, about 4 per cent. on medium shades, is required to give results of any value. The only point in favor of the use of these metals is the fact that they do not cause as great changes in shade as does copper sulphate. This is not a sufficient reason to make them valuable as after-treating materials, as with a little practice the difficulty of matching dyeings treated with copper is overcome.

Salts of other metals have been tried but are of little or no value. The stannous salts, for instance, strip most substantive colors and are therefore not to be considered.

Zinc sulphate, in some cases, causes an increase in the fastness to light, but its action is so mild that it cannot be considered of any practical value. The action of salts of iron (the acetate or sulphate) is similar to the aluminium compounds, except that they do not increase the fastness to water to any extent. Pyrolignite of iron may be used for the purpose, either hot or cold, but it is only applicable to blacks or shades that are to be made dull. In fact, this is the reason why iron salts are so little used for after treating. They have a saddening effect on most direct colors and are chiefly used for that purpose. In such cases the fastness to washing is usually increased, but that is not the reason for giving the treatment.

Ferrous sulphate or copperas is the form in which iron is mostly used and it is applied in proportions ranging from 1 to 3 per cent. at the boil, or warm, depending on the shade. Dark shades and particularly blacks, are sometimes passed through both sumac and iron baths, which increase the fastness to washing and also give the material an additional 10 per cent. of weight. The goods are left for one to two hours in a cold or warm bath of 10 to 15 per cent. of sumac. On removing, they are wrung and subsequently saddened with pyrolignite of iron at 2° to 4 1/2° Tw., the material being turned frequently. A good rinsing finishes the operation.

Salts of manganese have an action very similar to that of iron, but to a less degree, and where such saddening action is desired, it is much cheaper to use the iron compounds.

In only one case is chloride of lime of any value as an after-treating agent and that is in the case with Primuline. The material is first dyed with Primuline, rinsed, and then entered in a cold, clear solution of chloride of lime standing at 1/2° Tw. It is worked for a half hour, rinsed, soured well with hydrochoric acid, and then thoroughly washed. As a result of this treatment, Chloramine Yellow is formed on the fiber and the dyeing is fast to washing, milling, light, acids and bleaching.

In odd cases other substances than those considered above may be found of value, but the desired effect may not be primarily the fastening of the shade. For instance, by impregnating the material with a solution of sodium paratungstate ($Na_{10}W_{12}O_{41}$) and then drying without rinsing, the fabric is rendered fireproof and as the shade is not affected the method is of considerable value. This operation slightly increases the fastness to light, but the effect is lost on washing.

Another method by which the resistance to light may be somewhat increased is to pass the dyed material through a 1 to 10 per cent. solution of sodium thiosulphate and dry without washing. The beneficial effects of this treatment are lost when the material is reached, hence the process is of little value.

In the foregoing, only dyeings with substantive dyestuffs on cotton materials have been considered, but it must not be supposed that these operations are of no value in connection with other fibers. The direct colors are extensively applied to wool, silk, linen, jute, China grass and other fibers, and it is customary to increase the fastness of the dyeings in much the same manner as above described.

As a rule, direct colors on wool are faster than on cotton and many of them can be fixed so as to resist a heavy milling. Good examples of this are Diamine Fast Red F fixed with fluoride of chrome or bichromate, and Diamine Browns M and B fixed with chrome and bluestone. Copper sulphate and chromium fluoride may be used on silk, linen, jute, etc., just as readily as chrome, but generally when it is desired to fasten a direct dyeing on silk to the effects of water, a tannin treatment is employed.

Unions are very often given a chrome and bluestone treatment to fasten them to milling. The method previously described of employing chrome and formaldehyde is also of value in connection with unions.

On mercerized cotton the same methods as for ordinary cotton are used, except that 20 per cent. less of the metallic salt will be found sufficient, due to the difference in the structure of the fibers.

It is evident that there is still plenty of room for improvement in the methods for increasing the fastness of direct dyeings, but in all probability any further advancement will have to be made in the dyestuff itself. It seems improbable that any method can be devised by which all dyestuffs of the substantive class may be after treated and rendered equally fast in all cases to light, washing, milling, etc. From the dyer's standpoint, that is a thing greatly to be desired, as it would eliminate the necessity of laboratory tests, preliminary to dyeing, that one now necessary to determine whether or not a dyestuff will be benefited by an after treatment. Nevertheless, the introduction of the methods of after treatment here given, have been and will probably continue for some time to come, to be of the utmost importance to the dyer.

Faster substantive colors are being produced from time to time, but it will be a long time before we can produce dyeings sufficiently fast to meet all the requirements of the trade without resorting to after treatments. Doubtless the newer vat colors and sulphur colors are a long step toward fast shades on cotton, but they are not all that is to be desired because of their cost, difficulty of application, and lack of variety of shades. It is not improbable, however, that in these dyestuffs lies the solution to the problem of cheap, fast colors on cotton.

PRACTICAL DYEING

BY RENMARK

(Continued from July.)

In dyeing it must be remembered that colors do not go on like paint, but unite with the fiber and with any colors which are on the fiber. On a black-board one may make a white or green mark, but if a piece of material is black it is not possible to dye it red, green, blue or any other color until the black has been removed. Thus it will readily be seen that much study and experience is necessary to produce proper results, for not only does one need to understand thoroughly the dyestuff to be used, but also possess a knowledge of the textile fibers.

The textile fibers are divided into two classes:

1. Vegetable.
2. Animal.

The vegetable fibers include cotton, linen, jute, hemp, etc.

The animal fibers are wool, silk, hair, etc.

The direct cotton colors are used mostly for the vegetable fibers, and the acid colors for the animal fibers, but this rule is not without exceptions for it is necessary at times in order to produce certain effects to use the acid colors on cotton, in which case special formulae obtain.

The many colors which are at the disposal of the dyer are divided as follows:

1. Natural colors.
2. Mineral Colors.
3. Artificial or Aniline colors.

Natural colors are those occuring in nature or which can be produced therefrom by comparatively simple means. These are very numerous and interesting, and the methods for their production and uses would undoubtedly have been greatly improved had it not been for the discovery of the artificial or coal tar colors which absorbed the attention of nearly all chemists interested in dyestuffs and coloring matters. The use of

natural coloring matters, which include indigo, logwood, fustic, madder, rosewood, cochineal, has greatly decreased on account of the cheapness, superior shades and easier application of coal tar colors. The production of some of the natural colors is nearly if not wholly a thing of the past.

The mineral colors, as their name denotes, belong to the mineral kingdom and include chrome yellow, chrome green, chrome orange, iron buff, manganese brown, Prussian blue and a few others, but these also have lost their prominence since the advent of the artificial colors.

The artificial or coal tar colors form the third and by far the largest and most important group and are known as aniline colors. The word aniline is derived from the Spanish "Anil" which means indigo, and was proposed by Firtsche, who in 1840 prepared aniline from indigo by means of caustic potash. Aniline was, however, first discovered by Unverdorben and was called by him "crystalline."

Aniline was not manufactured on a large scale until W. H. Perkins accidental discovery of mauve in 1856 thus creating a big demand for aniline and to him belongs the honor of being the originator of the present extensive aniline industry.

When coal tar is distilled products are obtained which are either lighter or heavier than water. By collecting these in water they are separated into so called light oils which float on the water and heavy oils which sink beneath the water. Benzene is found in the light oil and obtained from it. (Benzene, also called benzol, should not be confused with benzine, which is a petroleum product known as coal oil.)

By the addition of sulphuric and nitric acid, benzene is converted into nitro-benzene and by reducing with iron and hydrochloric acid we get aniline oil. When chromic acid is added to aniline oil, nitric acid or other chemicals combined in different operations, various substances are obtained which after purification are known as different kinds of aniline colors.

Aniline oil is a colorless oil which soon becomes brown under the influence of light and air. It has a light aromatic smell and a burning taste. When inhaled the vapors are poisonous, causing a dangerous illness known as Anilisme (one not uncommon in color works. The oil when taken internally is also poisonous. Aniline hydrochloride, or aniline salt, which is aniline oil in a different form, is sold in grey leaf shaped crystals which are freely soluble in water and alcohol and find practical use in the black dyeing of cotton textiles, especially stockings.

The foregoing gives a general idea of dyeing and the coloring matters and shows in a general way the scope of this subject.

The articles following will deal with the different fibers, methods, colors, tests, etc., in a specific way and will prove advantageous to all who carefully follow the successive editions.

(To be continued.)

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BLEACHING AND DYEING OF COTTON HOSIERY

By LOUIS J. MATOS, Chemical Engineer

The most satisfactory bleach for cotton hosiery is that based upon the use of chlorine, whether produced from bleaching power or by means of the so-called electrolytic bleach liquors and machines which have been considerably adopted during the past few years.

While the bleaching powder process has been in use for many years, there has always been a certain feeling against it on account of the occasional, and sometimes serious, injury to the goods being bleached, not alone a tendering of the fibers, but a source of color unevenness when the bleached goods were afterwards to be dyed pale and delicate shades.

As generally carried out, bleaching with bleaching powder solutions follows a previous thorough cleansing of the goods by kier boiling with or without pressure, and always with alkali, for the purpose of removing the oils and dirt that always attach themselves to the yarns, etc., and also to effect a more or less complete removal of the oils and waxy matters natural to the cotton fiber. According to the grade of cotton originally

used, these alkaline liquors may be weaker or stronger. About 5 per cent. of soda on the weight of the goods is generally sufficient. The operation is conducted boiling for several hours, after which it is followed by a thorough rinse, when the solution of bleaching powder is run in and kept circulating until the proper degree of whiteness is secured. The strength of this solution varies with the practice of different bleachers. Some prefer to give a longer time immersion in weak liquors, while others prefer short immersions in stronger solutions. The former method is much the better, as the bleacher has more perfect control over his batches.

The strength of the bleach liquors from bleaching powder should be used not greater than 2° Tw., while 1 1/2° Tw. is better. For goods made of very fine yarns, even 1/2° Tw. is found to be quite effective. Wooden kiers or bleach tanks only should be used, and their capacity should not exceed 1,000 lbs. After bleaching, which should, normally, not require more than 3 to 4 hours for 2° solution, the goods are well washed, and usually given a thorough sour in weak sulphuric acid, following which they are well rinsed, when they are ready to be dyed.

The disadvantage of the bleaching powder process is that the goods are now free from lime in some form which acts against the possibility of procuring level shades, and it is important to note that bleaching is now more commonly done with solutions of sodium hypochlorite, made by acting on a paste of bleaching powder with a solution of soda ash, according to the following practical recipe:

Bleaching Powder ..... lbs. 100
Water ..... gals. 50

Work into a thick cream or paste by stirring, taking care to break all lumps.

Prepare a second solution by dissolving

Soda Ash ..... lbs. 60
Water ..... gals. 25

boil, and add

Water ..... gals. 12½

The soda ash solution is now poured into the bleaching powder solution, the whole thoroughly stirred and allowed to settle, and the clear top liquor drawn off without disturbing the sediment, when it is washed with several changes of water, allowing to settle after each wash, when it is drawn off and added to the main volume of bleach, thus diluting it until it stands at 6° or 7° Tw., yielding a total volume of about 185 to 190 gallons. This solution will answer for most bleaching purposes, but it should be made completely free from remaining traces of lime by adding 2 lbs. of soda ash, and allowing the fine precipitate to settle. This solution is then ready for use. While it may appear that its preparation is difficult, it is not so, especially if the bleacher has prepared several casks or vats of sufficient size.

The advantage of this bleaching solution over that made directly from bleaching powder is that it is without injury to the goods to be bleached, that no lime (calcium) deposits are found in the bleach tanks or on the goods, and that the peculiar odor of "chlorine" after bleaching is not present. The goods, also have a much softer and generally better "handle."

In some small mills, where bleached goods are produced only occasionally, or where very delicate tints are dyed only for special order, bleaching may be done by loosely packing the goods in a circular vat, after having been boiled out, and allowing the bleach liquor to run in and cover them, or else a winch may be used to work the tube in and out of the vat, but this latter method is not the best. Kier or vat bleaching with hypochlorite of soda is always the best.

The electrolytic bleach is gradually gaining recognition and it will only be a question of time when large bleach works will be operating by this method. There are several processes, or rather types of electrolysers in use, all of which are good. The raw material for use in the electrolyser is a solution of common salt, which, after the electric current is passed, is changed into sodium hypochlorite, which is the solution used directly for bleaching.

Ordinary hypochlorite of soda, as used for

bleaching, and prepared from bleaching powder as above described, is tested for its bleaching value, not by the Twaddle glass, but by a simple chemical process as follows: A solution of hyposulphite of soda is made to contain 6.95 grammes per liter, this must be exact, also a solution of potassium iodide (10 per cent.) and a solution of hydrochloric acid. To make the test, 10 ccs. of bleach solution is transferred to a flat bottom flask, and a few drops of the iodide solution added until the contents are no longer turbid. Then add a few cubic centimeters of the hydrochloric acid until the liquid becomes a clear brown, then run in from a graduated burette the hyposulphite solution until the last drop changes the pale yellow color to colorless. Each 1 cc. of the hyposulphite solution used equals 1 milligram of active chlorine in the 10 ccs. of bleach liquor taken for the test.

The following table gives the strengths of bleach liquors, the number of ccs. of hyposulphite solution required, and the corresponding grains of active chlorine per U. S. gallon.

SODIUM HYPOCHLORITE SOLUTION

No. of ccs. Hyposulphate per 10 cc. of bleach liquor	Grains of Active Chlorine per U. S. gallon	Per cent. of Active Chlorine by weight
10.35	58.36	0.1
20.07	116.71	0.2
41.4	233.43	0.4
62.1	350.15	0.6
82.8	466.87	0.8
103.5	583.59	1.0
124.2	700.3	1.2
144.9	817.02	1.4
165.6	933.74	1.6
186.3	1050.46	1.8
207.	1167.18	2.0
227.7	1283.98	2.2
248.4	1400.61	2.4
269.1	1517.33	2.6
289.8	1634.05	2.8
310.5	1750.77	3.0

There are 80 silk mills in Switzerland, with 14,000 looms and about 25,000 employes, the majority of whom are women. The wages paid range from 58 cents to $1.15 per day. Warehouses, printing mills, dyeing establishments, raw-silk business, and kindred industries, are not included in these figures.

HYDRON BLUE, PATENTED

Under the above title, Cassella Color Company has just issued to the trade a handsome octavo volume, descriptive of the two new vat-dyeing colors designated respectively Hydron Blue G and R. This volume shows the result of practical work done with each of these colors upon cotton, in almost every stage of manufacture, from raw stock to finished goods.

American manufacturers will be particularly interested in the examples of work done on loose cotton, on account of the extreme uniformity and brilliancy of shade, which is a remarkable result, considering the simple manner in which the Hydron Blues are dyed. Piece goods dyers will be interested in the specimens of work showing Hydron Blues upon both loosely and closely woven fabrics made of cotton and cotton and linen mixtures.

A very interesting chapter is devoted to the application of Hydron Blues to cotton dyed in dyeing machines, and specimens of work so dyed are shown, giving practical application of the Hydron Blues to both cops and cheeses.

Hydron Blues, of necessity, must be compared with indigo as the standard against which all cotton blues are by custom compared, but the Hydron Blues possess features not shared by Indigo. Their fastness to light is remarkable, stated to exceed in permanence that of Indigo; to washing excellent, the dyeings not being altered in shade even by the severest treatment, and white cotton is not stained, even in the presence of boiling soda; when boiled with white wool, in an acid bath, the wool remains perfectly white. In fastness to chlorine and bleaching, the dyeings are stated to be in every way superior to Indigo. This is well illustrated on page 33 of the volume, dyeings 71 and 72, which show the influence of chlorine bleaching on fabrics woven with yarn dyed with the Hydron Blues together with White. To stoving, hot pressing and friction, the fastness is very good.

Of interest to warp dyers and manufacturers of striped and checked piece goods is the

fact that Hydron Blues retain their shade in sizing.

The first twenty pages of the volume are devoted to technical details of the application of Hydron Blues, and no apparent point in the manipulation has been overlooked.

Cotton dyers and manufacturers of cotton goods who are desirous of becoming posted on the advances in vat-dyeing fast blues should avail themselves of the opportunity of obtaining a copy of this book from any of the branches of the Cassella Color Company.

TESTING THE ACTION OF LIGHT UPON DYED SHADES

(Continued from June.)

2. All patterns must be equidistant from the source of light.

3. All patterns must be partly covered, but in such a manner that at any time each individual pattern may be removed for investigation.

4. The patterns must be exposed in as pure an atmosphere as possible, and one with a fairly high and constant moisture content.

The apparatus given below in plan and section may be taken to fulfil these requirements: a is the lamp, b, the inner wall and top, c, the outer wall and bottom of the circular chamber in which the patterns are placed; b is painted white on the side nearest the light to obtain as much reflection as possible, and carries a slit, s, behind which the patterns, m, hanging upon supports, d, are exposed; r is a trough supplied with water from a vessel, g, and the moisture content of the atmosphere is read off on a hygrometer, h, which is visible through an opening, f, in the wall, c.

Where large numbers of exposures have to be made, suitable variations could readily be devised.

The comparison of a faded shade with a standard type is so difficult, and the conclusion formed is such a matter of personal opinion, that to obtain reliable results it appears advisable to use a standard scale of grey, which would serve as a basis for determining with some degree of accuracy the difference between the faded and the unfaded portion of the exposed pattern.

Of course many colors become merely lighter in shade by exposure, whereas others become duller or of quite a different tone. In any case the best measure of the amount of change lies in the amount of color remaining unaffected. This can best be determined objectively by photographing the pattern upon an orthochromatic plate, behind a filter corresponding to the shade of the color. Only such rays as are reflected from unchanged particles of the color will pass through the filter, and act upon the plate, and this is then developed with a standard developer, and the difference between the photographs of the faded and unfaded parts of the pattern determined with reference to the scale of grey above mentioned.

The effects of exposure upon any color are thus reduced to a general scale, which may be standardized and consist of 6-10 graduations, permitting of a definite statement as to the fastness, instead of the indefinite descriptions "fast," "fairly fast," "moderately fast," etc.

Such a scale of grey for comparison having been adopted as to the standard, and the length of exposure and distance from the standard light, as also the best condition of the atmosphere as regards moisture having been agreed upon, the fastness properties of dyestuffs might be recorded in a manner similar to the examples given below:

Name of Dyestuff	Fiber	Method of Dyeing	Time of Exposure	Shade of Exposed Portion	Degree of Fading
Dianil Blue (Maker)	Mercerized Cotton	50% NaCl 1% Color 1½ Hours Boil	100 Hours	Blue Black	5
Indigo (Maker)	Wool	2% Color	100 Hours	Lighter, but No Change in Tone	1

Which, in the latter case, would indicate that a 2 per cent. indigo dyeing, dyed according to the process recommended by the manufacturer, fades (without any change in shade) to the extent of one degree of the grey scale in 100 hours. This is a tentative suggestion towards the formulation of a standard method of testing, and it may be advisable to make alterations in the arrangement, or to make practical trials to determine the most suitable one.

It was suggested above that the provision of a special testing house would probably meet the case best, but the views upon this point are divided. A point in its favor would be that in combination with its arrangements might be made for the investigation of the problems attending the production of shades fast to light, and for research into the causes producing fading, etc. The solution of these problems will only result from the application of the widest knowledge and the most delicate scientific methods available, but the deeper the insight gained into the real causes of fading, the greater the possibility of finding means whereby this action of the light may be counteracted, and really fast dyeing produced. Already the investigation of the subject has opened out new points of view with regard to the points to be aimed at, and developments may possibly be expected in the near future.

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Dye Recipes

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 113

BLUE ON WORSTED YARN

Patent Blue W E on 100 lbs. worsted yarn. Prepare the dye bath with.

3 lbs. Patent Blue W E.
(H. A. Metz & Co., 122 Hudson St., N. Y.)
20 lbs. Glauber's Salt.
5 lbs. Sulphuric Acid.

Enter the goods at 120° F., bring to a boil, and dye at a boil for one hour.

Patent Blue W E will be found useful for the dyeing of silk-wool unions, as the silk is dyed the same as the wool.

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Recipe No. 114

BLACK ON WORSTED YARN

Agalma Black 10 B on 100 lbs. worsted yarn. Prepare the dye bath with

6 lbs. Agalma Black 10 B.
(Badische Co., 86 Federal St., Boston.)
20 lbs. Glauber's Salt. Crystals.
5 lbs. Sulphuric Acid.

Enter at 120° F., and dye at a boil for one hour.

Agalma Black 10 B is a level dyeing acid black and is well adapted for the dyeing of woolen piece goods.

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Recipe No. 115.

YELLOW ON WORSTED YARN

Hydrazine Yellow L E R on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Hydrazine Yellow L E R.
(Geisenheimer & Co., 189 Front St., N. Y.)
10 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 140° F., bring slowly to a boil, and dye at a boil for one hour.

Hydrazine Yellow L E R is a level dyeing acid color and will be found excellent for the production of compound shades and self colors in wool dyeing.

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Recipe No. 116.

BLUE ON UNION PIECE GOODS

Fast Union Colors on 100 lbs. goods. Prepare the dye bath with

3½ lbs. Tetrazo Fast Blue 2 B.
1 lb. Tetrazo Fast Lilac B O.
5 lbs. Wool Blue G.
(American Dyewood Co., 84 William St., N. Y.)

Make up the dye bath with the requisite amount of color and 20 lbs. common salt. Run in the goods at 140° to 150° F., raise to a boil in 15 to 20 minutes and boil one-half hour or to shade. The quantity of water used in dyeing should not exceed 3/4 gals. per pound of goods.

The above dyeing represents a line of dyestuffs specially adapted for producing on union fabrics fashionable shades of extreme fastness to light. These dyestuffs are fully illustrated in their new

shade card No. 139 D entitled "Fast Fashion Shades on Union Dress Goods," a copy of which will be forwarded on application.

Recipe No. 117.

RED ON WORSTED YARN

Mercerol Red C on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Mercerol C.
(Read Holliday & Sons, 11 Gold St., N. Y.)
10 lbs. Glauber's Salt.
3 lbs. Sulphuric Acid.

Prepare the dye bath in the usual way for dyeing these colors. Mercerol Red C possesses excellent fastness to light and stoving.

Recipe No. 118.

BLUE ON WORSTED YARN

Fast Navy Blue L A on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Fast Navy Blue L A.
(F. E. Atteaux & Co., 174 Purchase St., Boston.)
10 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

Enter at 140° F., and dye at a boil for 1/2 hour. Then add

3 lbs. Sulphuric Acid,

and dye at a boil for 1/2 to 3/4 of an hour.

Fast Navy Blue L A is readily soluble, and possesses the ordinary properties of the acid colors.

Recipe No. 119

GREEN ON WORSTED YARN

Milling Green S on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Milling Green S.
(Read Holliday & Sons, 11 Gold St., N. Y.)
10 lbs. Glauber's Salt.
3 lbs. Sulphuric Acid

Prepare the dye bath in the usual manner

Milling Green S possesses excellent fastness to light, milling and stoving.

Recipe No. 120.

BROWN ON COTTON YARN

Immedial Dark Brown D S Pat. on 100 lbs. cotton yarn. Prepare the dye bath with

12 lbs. Immedial Dark Brown D S Pat.
(Cassella Color Co., 182 Front St., N. Y.)
½ lb. Soda Ash,
2 lbs. Common Salt

per 10 gals. dye liquor.

Dye in a volume of liquor equal to 20 to 25 times the weight of the goods, at a temperature just below the boil, for one hour. Squeeze well and rinse thoroughly.

Immedial Dark Brown D S Pat., as will be noted, is dyed without the use of sodium sulphide. Its properties are similar to the other sulphur browns.

Recipe No. 121.

BROWN ON UNION PIECE GOODS

Fast Union Colors on 100 lbs. goods. Prepare the dye bath with

3 lbs., 2½ ozs. Cotton Mode Brown.
9⅜ oz. Tetrazo Chlorine Orange R.
9⅜ oz. Tetrazo Chlorine Yellow G.
5¾ oz. Alizarine Brown R.
5¾ oz. Brilliant Alizarine Blue L A.
(American Dyewood Co., 84 William St., N. Y.)

Make up the dye bath with the requisite amount of color and 20 lbs. common salt. Run in the goods at 140° to 150° F., raise to a boil in 15 to 20 minutes and boil 1/2 hour or to shade. The quantity of water used in dyeing should not exceed 3/4 gallons per pound of goods.

The above dyeing represents a line of dyestuffs specially adapted for producing on union fabrics fashionable shades of extreme fastness to light. These dyestuffs are fully illustrated in our new shade card No. 139 D entitled, "Fast Fashion Shades on Union Dress Goods," a copy of which will be forwarded on application.

Recipe No. 122

BLUE ON WORSTED YARN

Fast Navy Blue G on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Fast Navy Blue G.
(Cassella Color Co., 182 Front St., N. Y.)
20 lbs. Glauber's Salt.
5 lbs. Sulphuric Acid.

Enter at 120° F., and dye at a boil for one hour.

Fast Navy Blue G possesses very good fastness to light, washing and alkalies.

Recipe No. 123

BLUE ON WORSTED YARN

Xylene Blue B S on 100 lbs. worsted yarn. Prepare the dye bath with

1 lb. Xylene Blue B S.
(W. F. Sykes & Co., 85 Water St., N. Y.)

10 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter the material at 160° F., and dye at a boil for one hour.

Xylene Blue B S is especially recommended for its level dyeing properties and its fastness to light and washing.

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Recipe No. 124.

VIOLET ON WORSTED YARN

Wool Violet R L on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Wool Violet R L .
(Kalle & Co., 530 Canal St., N. Y.)
20 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 140° F., and dye at a boil for one hour.

Wool Violet R L produces a bright shade of violet which will be found useful in the dyeing of ordinary woolen material.

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Recipe No. 125

VIOLET ON COTTON YARN

Algole Corinth R Paste on 100 lbs. cotton yarn. Prepare the dye bath with

20 lbs. Algole Corinth R Paste.
(Farbenfabriken Co., 117 Hudson St., N. Y.)
½ lb. Caustic Soda 52° Tw.,
5 ozs. Hydrosulphite B A S F,
10 lbs. Glauber's Salt. Crystals,
per 10 gals. liquor.

In making up the dye bath the color should be stirred with warm water at 105° F., and the requisite amount of caustic soda added. This should be followed by the hydrosulphite. This solution is allowed to stand for 1/2 hour, or until the color is completely reduced, after which the necessary amount of Glauber's Salt is added.

Before adding the color solution to the main portion of the bath, it is well to add for every 10 gals. of liquor

½ oz. Caustic Soda Sol. 52° Tw.
⅓ oz. Hydrosulphite B A S F.

Dye cold for 3/4 to 1 hour, keeping the goods immersed in the liquor. After this, squeeze well, expose to the air for 1/4 hour, rinse in water, and finally in water acidulated with sulphuric acid, to the extent of 2 ozs. for every 10 gals. of water. After this acidulation rinse again and soap, at a boil, in an alkaline soap bath for one hour.

Algole Corinth R Paste possesses excellent fastness to light, and very good fastness to alkali, boiling, acid, and chlorine.

Recipe No. 126

RED ON COTTON YARN

Benzo Purpurine Conc. on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Benzo Purpurine Conc.
(F. E. Atteaux & Co., 174 Purchase St., Boston.)
30 lbs. Common Salt.
2 lbs. Sodium Carbonate.

Dye at a boil for one hour.

Benzo Purpurine Conc. is a very bright red color, and possesses the properties characteristic of the direct cotton colors.

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Recipe No. 127

BROWN ON WORSTED YARN

Palatine Chrome Brown G G X on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Palatine Chrome Brown G G X.
(Badische Co., 186 Federal St., Boston.)
20 lbs. Glauber's Salt. Calcined.
8 lbs. Acetic Acid.

Enter the material at 120° F., bring to a boil and dye at a boil for 3/4 of an hour, finally adding

1 lb. Sulphuric Acid

and boiling until the bath is nearly exhausted. After-treat in a bath made up with

2 lbs. Potassium Bichromate

and boil for 1/2 hour longer.

Palatine Chrome Brown G G X possesses good solubility, and its fastness to light, washing, milling, perspiration, rubbing and ironing is good.

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Recipe No. 128

OLIVE ON COTTON YARN

Thioxine Olive G O O on 100 lbs. cotton yarn. Prepare the dye bath with

7 lbs. Thioxine Olive G O O.
(Geisenheimer & Co., 189 Front St., N. Y.)
9 lbs. Sodium Sulphide. Crystals.
3 lbs. Sodium Carbonate.
20 lbs. Glauber's Salt.

Enter just below the boil and dye at this temperature for one hour.

Thioxine Olive G O O possesses very good fastness to light, cross dyeing and washing, and will be found to possess the properties characteristic of the sulphur colors.

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During the 1909-10 season there were 818,330 bales of wool sold in Sydney, Australia, representing a value of approximately $55,000,000.

New Machinery and Processes

This department is designed to present from month to month a brief mention of new machinery, devices and processes being brought out in this country and abroad, that are of interest to the textile manufacturers. It is not a list of patents but of improvements on the market, the idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.

Whenever possible we endeavor to make a personal investigation of the new machinery and processes described in this department. In the absence of such personal investigation we must necessarily rely upon information obtained from those who control the machines and processes.

We invite machine builders and others to send us such information for this department.

Pneumatic Fallers. Oscar Schimmel & Co., Chemnitz, Germany. An improved device for spinning mules by which the tension on the fallers is produced by air pressure instead of weights.

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Spinning Mule. Wilhelm Reents, Plauen, Germany, has recently brought out an improvement in the driving mechanism of spinning mules.

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London Shrinking Process. The Paul Klug Textil Machinenfabrik, Crimmitschau, Germany. An improved apparatus for treating wool goods by what is known as the "London shrinking" process. The American agent for this concern is L. H. A. Schwartz & Co., 53 State St., Boston, Mass.

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Decorticating Machine. Max Einstein, Hamburg, Germany. An improved machine for decorticating ramie fiber.

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Winding Frame. Asa Lees & Co., Oldham, England. A quick traverse split drum machine for winding yarn in the form of cheeces or on spools.

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Collar for Mule Spindles. Donat & Co., Manchester, England. A flexible collar or bolster for mule spindles which is said to offer a number of important advantages.

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Spooling Machine. J. Schweiter, Horgen, Switzerland. An improved spooling machine designed to produce a cross wind. It is claimed to maintain a uniform tension.

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Warp Stop Motion. E. Corty & Co., Krefeld, England. A warp stop motion especially designed for silk looms.

Water Mangle. James Farmer & Sons, Manchester, England. A water mangle embodying a number of improvements. The bearings are of special constructions, the step and side liners being of gun metal. The machine is driven either by a steam engine or electric motor.

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Electric Baling Press. Hindle, Maitland & Co., Manchester, England. A baling press which is driven by an electric motor mounted on the upper and stationary press head. The lower and movable head is suspended by wire rope which pass around sheaves driven by the motor and reduction gears.

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Carpet Loom. Robert Seyffarth, Dortmund, Germany. A loom for weaving imitation oriental rugs.

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Shedding Device. Tattersall & Holdsworth, Burnley, England. A positive attachment for producing the warp shed in weaving and which is said to offer a number of important advantages.

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Hand-Threading Shuttle. Kirk & Co., Blackburn, England. A shuttle that is threaded by hand and which thus obviates the objectionable practice of shuttle kissing.

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Separator for Spinning Frames. Howard & Bullough, Accrington, England, have recently brought out an improved form of their well known separator, the improvement consisting in affording greater fingering facility for piecing and doffing. It is called the "Fingerspace" separator.

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Warp Slasher. Georges Masurel, Roubaix, France. An improved method of drying yarn on warp slashers.

THE VACUUM CLEANING SYSTEM SUCCESSFULLY APPLIED TO TEXTILE MILL USE

When the vacuum system of cleaning was successfully introduced for public buildings, hotels and private dwelling houses several years ago, textile manufacturers were attracted to its possibilities for mill use, for if it could be adapted to mill conditions, the advantages of this easy, thorough and economical method of cleaning a mill were very apparent.

The problem of cleanliness is no simple or optional matter in the textile mill, for dirt and fly are a continual menace to the quality of the goods, and the higher the grade of the yarn or fabric, the greater menace the dirt and fly becomes.

The trouble with the vacuum principle of cleaning for textile mills has been to apply the process in a proper way. Several obstacles have immediately confronted the would be experimentor, which are worthy of explanation, and combined with these obstacles are a few inherent physical properties of vacuum cleaning apparatus, which tend to complicate the problem.

There are two general types of vacuum cleaning apparatus, the high and the low vacuum. The high vacuum apparatus uses a comparatively small amount of air at a relatively high vacuum. The low vacuum apparatus uses a comparatively large amount of air at a relatively low vacuum.

The high vacuum machine is a very desirable type for cleaning rugs, carpets, upholstered work, etc., where an intimate contact of the nozzle can be obtained, but the small amount of air used does not commend this type of apparatus to textile mills where a close contact cannot be obtained, and where the dirt to be handled is more a matter of surface lint and fly than like the dirt imbedded in upholstery fabrics or carpets. The low vacuum machine with its large volume of air, seems to fit textile conditions best for the reasons just mentioned.

There are innumerable patents on vacuum cleaning apparatus in which the vacuum is produced by many different mechanical means, such as the simple diaphram of the house machine, and the fan, blower, or vacuum piston pump of the large hotel installations.

The method of driving these vacuum producers ranges from the simple hand operated lever through the whole gamut of belt, steam engine, gasoline engine, electric motor, etc. None of these machines, however, lend themselves to practical use in the textile mill.

The hand operated machine is of course a joke when used for this purpose. The large central plant is not commercially practical, although it has been tried. The difficulties were:

1. The long and circuitous system of piping all over the mill caused a tremendous loss in creating a proper vacuum at the points desired.

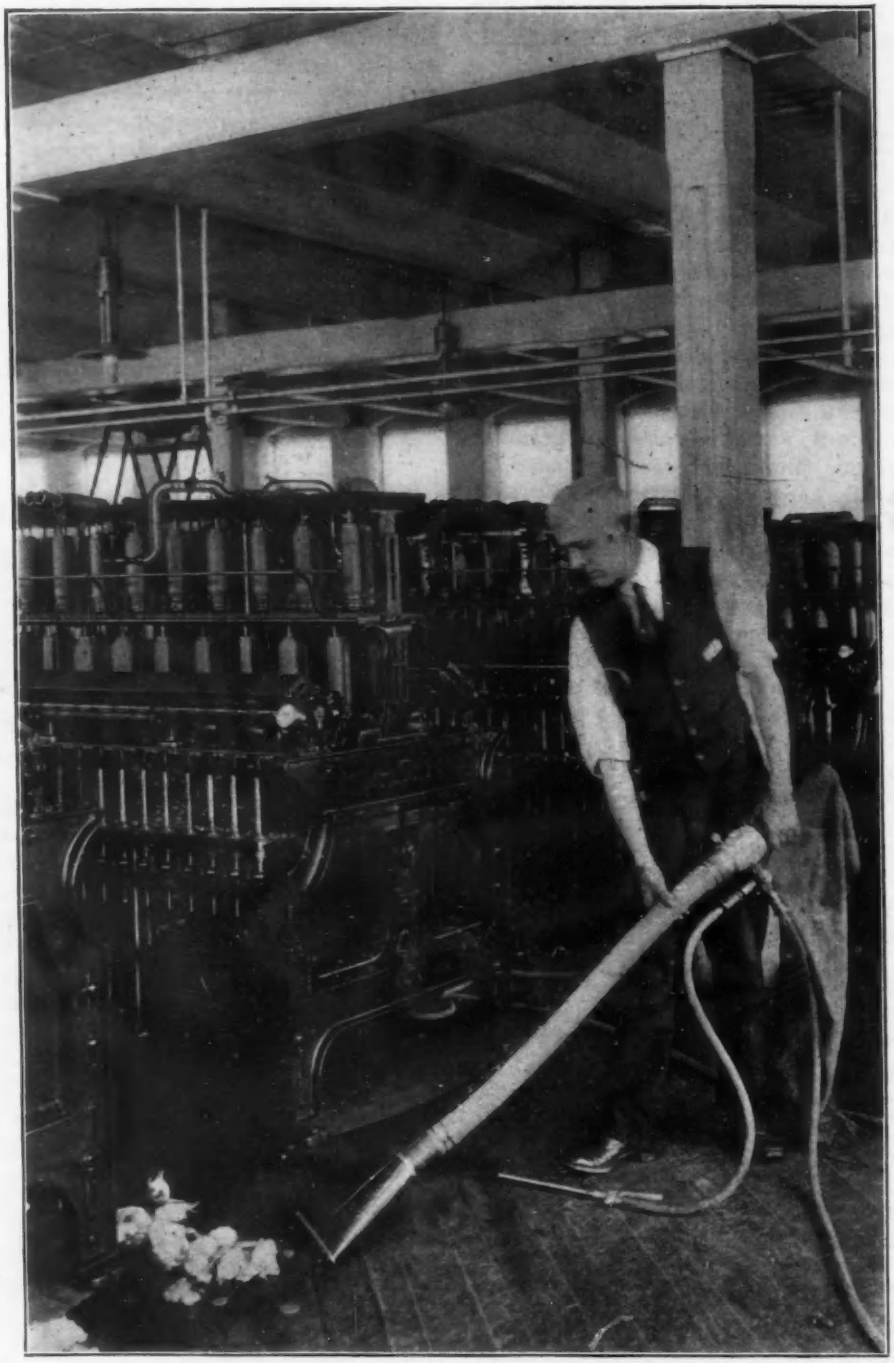
2. The pipes filled up with lint and oily fly necessitated frequent cleaning and menaced the plant from the fire hazard standpoint.

3. The first cost, as well as the cost of operation, was excessive.

These objections would indicate that the successful textile mill vacuum machine must be of the portable type.

Of this type, the electrically driven or gas engine driven machines are out of the question, because of the fire hazard so close to the large amount of lint, and further, too, in the case of the electric motor driven portable outfit, the power required is too much for ordinary lighting circuits, so that special wiring throughout the mill would be necessary.

The use of compressed air for cleaning textile machinery has already become quite common. It has proven very satisfactory even in the spinning rooms, but the dirt and fly which was blown off the machinery has had to be swept up from the floor by the old methods. Most of the mills using compressed air for cleaning are equipped with the Turbo Humidifier system, for the cleaning attachment can be employed with this apparatus at practically no extra expense. It is quite natural, therefore, that the G. M. Parks Co. of Fitchburg, the manufacturers



TURBO VACUUM CLEANER AT WORK IN A SPINNING ROOM. THE LOW VACUUM AND THE LARGE VOLUME OF AIR MAKES THIS CLEANER EFFICIENT FOR COARSE WASTE AND DIRT

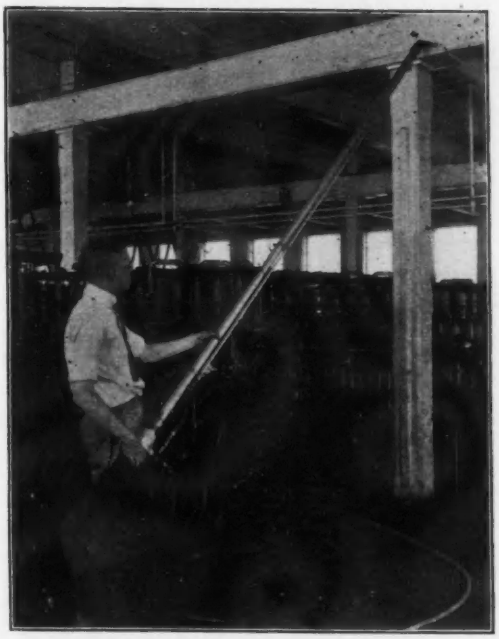
of the Turbo system, should have given much thought to vacuum cleaning, so as to round out and complete the usefulness of compressed air. Many mill men have brought it to their attention and urged them to investigate the possibilities of a practical vacuum cleaning system.

About a year ago they tackled the problem. The story of their experiments and failures shows how by a process of elimination they finally arrived at certain fundamental specifications for such an apparatus which is demanded by mill conditions.

Their first experiments were with a fan belted to an ingenious compressed air motor, for they early discovered that the only possible solution of the power problem in the alleys among the machinery was compressed air. They connected this with a dust collector and mounted the whole on a small truck. It did the work but it took a lot of power to operate it, and a mill which was equipped with only one of these devices, would never be clean all over at the same time, unless it was a very small plant, because this one machine could not cover a large mill in a day or a week, and if more than one machine had to be employed, the cost appeared to be prohibitive.

Some of their early experiments had been along the lines of the ejector principle, but these were abandoned for the seemingly more feasible compressed air outfit just mentioned. When it was found that that plan would not work, they went back again to the ejector type, and after long experimenting, solved the problem for an apparatus which would meet the conditions which they believe to be essential to mill use. The specifications which seem to be demanded by the conditions are as follows:

1. It must be of the low vacuum, large volume of air type to properly handle lint.
2. The device must be portable, because the large central unit is not feasible.
3. It must be small enough to pass through the narrowest alleys.
4. It must use compressed air for a motive power, because no other available power is practical.
5. The power required must be small.
6. The apparatus must lend itself to any possible cleaning organization:—whether a separate cleaning force, or cleaning by regular operatives.
7. It ought to be light, simple in construction, of few parts, high mechanical efficiency, small opportunity for clogging, easily cleaned if clogged by an extra large piece of floor waste, and capable of operation by a boy.
8. Since the apparatus is liable to be operated by the young or the unskilled, there should be no moving parts, no gears, nothing to catch in loose clothing of operatives.



OVERHEAD CLEANING WITH THE TURBO VACUUM CLEANER EQUIPPED WITH BOTH BLOWING AND SUCTION NOZZLES. THE TUBES ARE TELESCOPIC, PERMITTING ANY ADJUSTMENT.

A glance at the cuts will show how completely the Turbo Vacuum Cleaner conforms to the above specifications and more especially to the requirements under the seventh paragraph. The Turbo Vacuum Cleaner is of the low vacuum, large volume of air, type. It operates with a vacuum of 4 inches of

water, and induces a suction through the vacuum nozzle of 90 to 100 cubic feet of air per minute. It is portable, because the whole outfit, including collecting bag, suction hose and ceiling pole weighs about 15 pounds. It is so small as to be easily suspended on the back of a boy by means of a strap over the shoulder, or if preferred may

TURBO VACUUM CLEANER, SHOWING THE ADVANTAGE OF THE COMBINATION BLOWING AND SUCTION NOZZLES.

be dragged on the floor, or carried in one hand.

It uses compressed air at 30 pounds pressure, and only 20 cubic feet of air per minute are required to give proper results, although the device will work at any pressure above 30 pounds. The power cost of operation is therefore small.

It can be used either by a separate cleaning force, or a sufficient number can be purchased to enable the regular operatives to do the cleaning by passing the devices along from one to another.

The Turbo cleaner is light, and aside from the hose and dust collector bag it comprises but two pieces, neither of which is in motion. There are no moving parts, hence nothing to oil, wear or break. The high mechanical efficiency obtained would be impossible if there were any moving parts.

There is no opportunity for clogging because it is a straight, unimpeded passage 2 inches in diameter from the entrance of the suction hose to the collector bag, yet should an extra large piece of waste or a stick clog the hose or vacuum cleaner, the whole machine can be taken apart, cleaned and put together again in one minute. A 12-year-old boy can easily operate it.

The same apparatus is equipped for blowing as well as for vacuum cleaning. The small pipe and nozzle shown in the pictures is used for blowing, and the larger suction hose for the vacuum work. All that the operator has to do to change from one to the other is to turn a valve.

For floor work, a 3-foot length of 2-inch suction hose is used. For ceiling and pulley work this hose is replaced by a light aluminum telescopic tube, and by a simple arrangement this tube also has attached to it a small telescopic compressed air blowing tube, for dislodging with compressed air any dirt which the vacuum will not remove. By this means the device may be used in rooms of varying heights in the same plant.

There is no possibility of fire, because no spark of any sort can be caused by the apparatus. When the bag is filled it is dumped in a suitable place. The collector bag is easily replaced if torn. No metal receptacle is required to surround the collector bag, as the lint is blown into it, and the air carrying the lint passes out between the meshes of the collector bag. The bag may be worn out in time from dragging on the floor, but a new one costs but a few cents.

Aside from the hose and collector bag, the dimensions of the cleaner are 3 1/4 inches in diameter by 1 foot, 2 inches long.

It is not claimed this device will clean any

and every part of all textile machinery. It will not. A very high vacuum will not pull a postage stamp along the floor into any suction orifice from a distance 4 inches away, and a vacuum nozzle will not clean, for instance, a Northrop loom. This cleaner is intended as an extension of a compressed air blowing cleaning system. The compressed air blower must be used to get at the inaccessible parts of the machinery, for no better way has yet been devised. but the Turbo Vacuum Cleaner can be used to clean all the accessible places that a vacuum can possibly reach and will save stirring up the dirt and fly any more than is necessary. The Turbo cleaner will handle weave room waste, or the finest powder, bits of yarn or cloth, or a copper penny, a cigar butt or a shingle nail. It will entirely dispense with floor and ceiling sweeping.

Mills already equipped with the Turbo Humidifier and the compressed air cleaning system have only to buy these cleaners. They work from the same length of hose now in use for compressed air cleaning. It is only necessary to detach the nozzle and attach the cleaner to the old hose.

Mills not equipped with compressed air would have to install an air compressor, which should be independent of the mill power, and would have to pipe the mill with outlets left so that a 50-foot length of hose would reach to any part of each room. This is less expensive than most manufacturers imagine. The advantage of an independent means of driving the compressor is that the cleaning may be done when the mill power is shut down. The idea seems to be gaining ground that a weaver should be a weaver, and a cleaner should be a cleaner.

Then the weaver can weave, and the spinner can spin, and one man with his assistants would be responsible for the cleanliness of the whole mill. If desirable his men might come to work at noon when the power stops, cleaning pulleys, motors, etc., at noon, and continue until perhaps 9 o'clock at night. Every morning the mill would start fairly clean. Every Saturday afternoon it would thoroughly be cleaned. If such a plan were adopted, it would undoubtedly mean much less stoppage of machinery and a cleaner mill. The manufacturers of the apparatus believe that the saving in mill brooms would alone amount to a very considerable item and go far towards paying for the vacuum cleaners in a comparatively short time.

After the device was perfected, it was given a thorough try-out under practical mill conditions. Several of the machines are now in use. A number of orders were placed by mill men who had seen them, before the price of the machine had been determined. It has been explained and demonstrated to about twenty-five practical mill owners and agents, not one of whom has yet raised any objection to the principle or practical working of the cleaner, and twenty mills are already on the waiting list for a machine to be put in on trial at their request. The G. M. Parks Co. will be glad to give any further information desired by those who may be interested.

PATENT DUPLEX CARDING DEVICE

An invention effecting an important improvement in the carding process has been perfected during the last few months at the works of the Howard & Bullough American Machine Co., Ltd., Pawtucket, R. I. It has been inspected in operation by a number of New England mill treasurers, agents and superintendents and been highly commended, not only by praise, but by orders which have been placed by them for the device to be applied in their mills.

This device consists substantially of a roll very similar to the lickerin, but covered with a special clothing. This roll is placed underneath and closely adjacent to the lickerin. It is positively driven in the same direction as the lickerin, but at a very much slower speed. A doffing comb removes the short fibers and foreign substances from this slowly revolving roll. The object of the device is to remove motes, leaf, short fiber and foreign substances from the cotton before it reaches the cylinders and flats. The percentage of waste taken out by this duplex carding device can be varied according to the quality of work desired and the stock

used, a range of from 5 to 25 per cent. being possible without changing the settings of the card.

By taking out all of the motes, leaf and foreign substances at the point where this device is applied the life of the clothing is increased materially and it is not necessary to grind and strip the card as often as usual, consequently the clothing is always in a better condition for carding purposes.

Besides removing the foreign substances, motes and short fibers, it insures an even or uniform delivery of the cotton to the cylinder, thus eliminating cloudy carding. The action of this device is similar to a combing action on the cotton.

The flat strips, cylinder strips and doffer strips taken off a card to which this device has been applied, can be put back into the regular mixing, as they contain practically no foreign matter or nep.

It is stated that ordinary flat strips, cylinder and doffer strips can be reworked on a card with this device without any straight cotton being mixed with them, and that the production is equal to that of a card running on straight cotton; that 75 to 85 per cent. including the loss at the pickers can be reclaimed.

The direct results claimed for this device are briefly: superior quality of product practically equivalent to double carded work; increased product owing to the clean condition of the cylinder and flat clothing, enabling the card to do its best work at all times; better yarn; longer life of clothing, foreign substances having been removed from the cotton before it enters the cylinders and flats there is nothing to injure the cotton and less grinding is required, as the points remain in good carding condition for a longer time.

The simplicity of this device will appeal to any practical carder. There are no high speed parts to cause wear, and nothing where derangement of mechanism is possible. Mill treasurers, superintendents and carders are invited to investigate this device at the works of the Howard & Bullough American Machine Co. at Pawtucket, where a card is in operation.

A NEW AND IMPROVED TENTERING MACHINE

The accompanying illustration shows the driving end of a new tentering machine invented and patented by John J. Hoey, 26 Fountain St., Providence, R. I. Several machines of this design have been built by the inventor and after some months' operation are demonstrating very satisfactory results and features of improvement.

The most radical departure from the old style of machine is the arrangement for driving the sprocket-wheels which travel the chains of cloth-clamps. Instead of depending on bevel or spur gears arranged to slide on oscillating cross-shafts, all such gears are eliminated and a direct drive provided through the employment of flexible shafts.

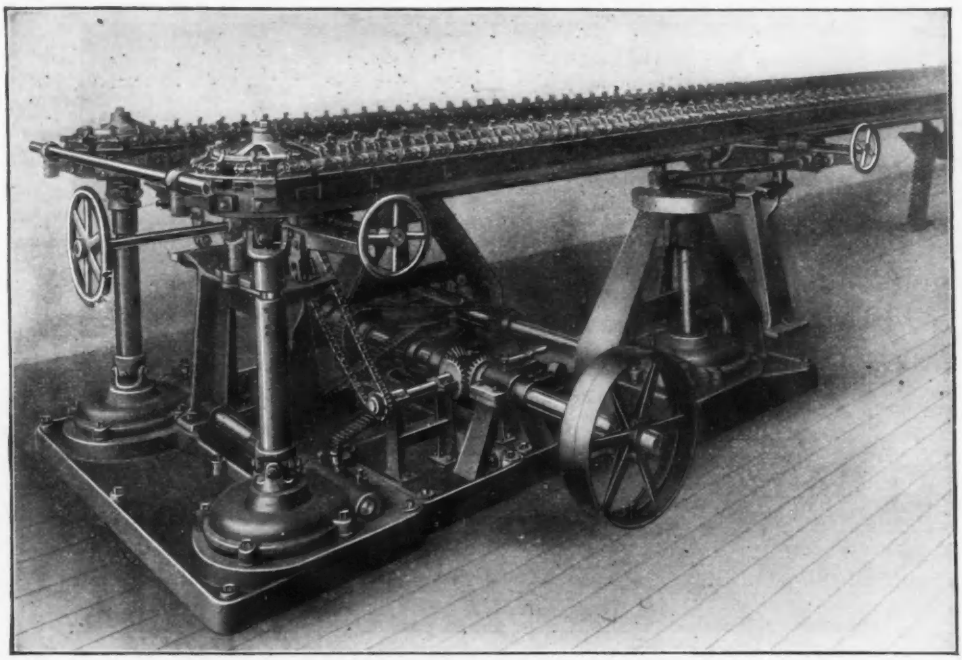
The main driving-shaft of the machine is connected to a second horizontal shaft by means of a noiseless, smooth-running link-belt. This second shaft drives two vertical stud-shafts through the medium of spiral-gearing completely enclosed and running in oil in housings on the bed of the machine. The stud-shafts are connected directly to the sprocket-wheel shafts by upright telescopic shafts provided with universal joints at their ends. These flexible shafts allow free movement of the sprockets with the longitudinal and lateral displacement of the side rails during their reciprocation; and also provide for adjustment of the rails toward or away from each other for different widths of fabric.

It will be noted that the driving connections above described are of ample dimension and present a particularly staunch and rugged appearance. The construction is remarkably neat and simple, being free from friction-producing joints and therefore greatly economizing power and insuring maximum durability. The elimination of spur and bevel gears from the drive does away with all backlash and lost motion and the chains are traveled with a constant speed, a highly desirable and long sought for feature in tentering machines. The absence of the jerky, uneven motion of the chains, common to many machines of this class, practically eliminates friction and wear on

the parts and prevents uneven strain on the cloth, thus enhancing the quality of the finished goods.

The mechanism for reciprocating the side-rails is also of novel construction and shows meritorious improvement. A horizontal shaft connected to the main driving-shaft by a link-belt drives two vertical shafts through the medium of spiral-gearing. Like those at the end of the machine, the spiral gears are enclosed in oil-tight casings. The two upright shafts carry crank-disks connected by pitmen to two opposite cross-arms. This arrangement is also protected by patent applied for and the design is such that a smooth, even motion is imparted to the rails without vibration or pounding. Suitable clutch and brake-devices are arranged to disconnect the reciprocating mechanism from the main shaft and means are also provided for adjusting the rails by power transmitted from the driving-shaft.

The whole machine is of particularly simple design, but of substantial construction and practically proof against wear or derangement. It is stated that it requires from 30 to 40 per cent. less power to drive than the old type of machines and, in some cases, a belt about half the width of those usually employed is sufficient. Experienced mill men have expressed surprise at the ease and quietness of its running and are outspoken in praise of its many features of improvement.



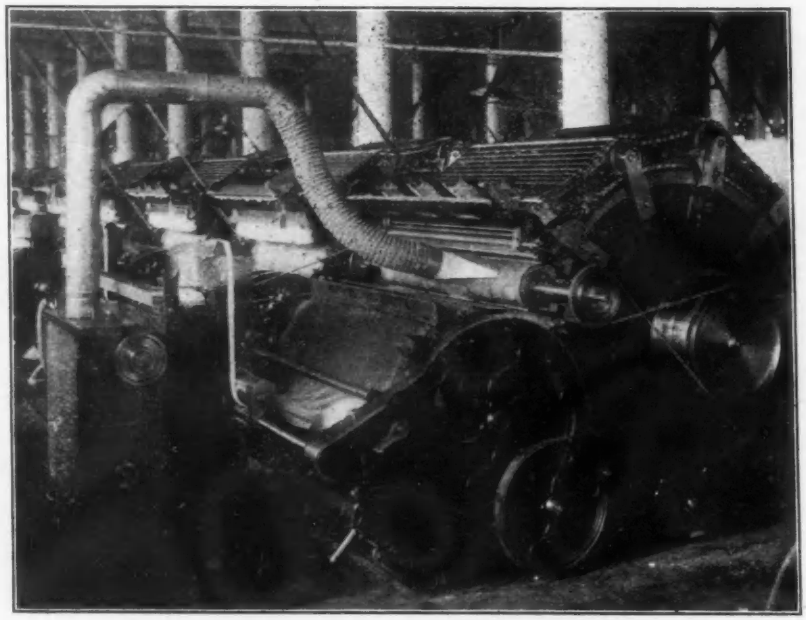
THE DRIVING END OF THE NEW HOEY TENTERING MACHINE.

The inventor is also the originator of an improved cloth-clamp which has been in use for some years and has met with signal success. The present machine is made in any length to suit mill requirements and when used in connection with the improved Hoey chain is guaranteed to give satisfactory results.

Broad patents have already been granted in the United States and principal foreign countries and additional applications are pending. The inventor will be glad to furnish further particulars upon request.

PORTABLE DUST REMOVER FOR COTTON CARDS

The removal of dust from cotton cards when stripping is taking place has become a very practical problem in cotton spinning mills in Great Britain, because of the increasing stringency of factory regulations. Leaving aside the sanitary aspect of the case, the practical advantage of getting rid of the neps and dust now thrown out by the stripping brush and distributed into the atmosphere and onto the card cylinders, doffers and flats and so into the carded cotton sliver, is very apparent.



PORTABLE DUST REMOVER FOR COTTON CARDS.

A portable machine for this purpose has been perfected and is now being used in a number of English mills. It is being introduced into this country by Mr. William Firth, 200 Devonshire St., Boston.

As shown in the illustration, this apparatus is of very simple construction. The body of the machine is mounted upon a base provided with four wheels. The framework is of angle iron braced together with tie-rods, whilst the top and bottom are of hard wood securely bolted to the frame. Fitted to the base is a vacuum producer or fan which at 1,500 revolutions per minute is said to be capable of moving 4,000 cubic feet of air per minute. The shaft upon which the fan is fixed is carried through to each end of the machine, small grooved pulleys being fitted at each end. A small metal pipe is connected to the vacuum producer, which is connected to the metal casing provided for the stripping brush by a flexible tube. One of the chief features of this apparatus is the means for separating the dust from the air drawn from the carding engine by the fan. Inside the case is a stout cotton bag or filter into which the air is exhausted, and as a result the particles of dust are collected and the air passes out into the case. As the sides of the case are also of stout cotton, covered with galvanized netting to give stability, the air again passes into the room, leaving all the dust behind.

The driving of the machine is very simple. A light grooved pulley is fitted at each end of the stripping brush; one of the pulleys

drives the brush, and the other the machine. When stripping, the operative brings the machine up to the front of the card. The stripping brush is then placed in the brackets on the cylinder, one stripper placing the band on the pulleys to drive the brush, and the other stripper adjusting the drive from the brush to the machine. The driving of the brush and machine are, therefore, simultaneous. The strong suction created by the fan effectively draws the dust, etc., into the case. The stripping brush is then lifted into the doffer brackets, the flexible tube is slipped off, and the brush stripped. The flexible tube is again fitted, the brush dropped into position, and the pulleys connected up as before. The stripping of the doffer being completed, the brush is lifted onto the machine and the whole apparatus moved to the next card. After a number of cards have been stripped, the filter inside the case is taken out and emptied where convenient.

The benefit derived from using this machine is that the dust is removed from the carding room without changing the present atmospheric conditions, either in temperature or humidity.

The machine is adapted for right and left hand cards, so that a separate machine for each hand driving is not required. The amount of dust that is collected surprises most superintendents when they see it gathered up in the machine, and it then becomes very apparent what a great benefit it is to collect at the point of origin before it is allowed to get into the atmosphere and injure the sliver, the machinery and the condition of the air of the room.

The handling of the apparatus is very simple, and its portability and comparatively low cost render the apparatus worthy of consideration. The freedom from overhead trunking, etc., is also a notable feature.

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The quantity of raw silk used in the United States increased from 9,761,000 pounds in 1899 to 17,471,000 pounds in 1909, or 79 per cent., while the corresponding increase in the cost of this material was 66 per cent.

MORE LIGHT FOR FACTORY ROOMS

BY CHARLES W. EASTWOOD

At the present time, when there is so much talk about factory economy and efficiency, considerable attention is being directed to the proper and the economical lighting of factory and mill rooms.

Modern buildings have increased window space, this being possible because of the pilaster form of wall construction, and thereby obtain probably more than twice the amount of daylight that was possible a few years ago. But there are bound to be dark places which are farthest removed from windows, and dark corners where artificial light may be needed in the daytime and surely needed early mornings and late afternoons.

It is possible to increase light in the daytime and to cut down the number of light units when artificial light is needed, by having ceilings and walls coated with a white and glossy paint. The full gloss, like enamel, which is most desirable, reflects light and makes it possible to utilize space which would otherwise be too dark.

It has been actually proven by scientific tests with the aid of the photometer, that from 19 to 36 per cent. more light has been produced in a certain mill room by the use of a pure white and glossy paint on the ceilings. This room was years ago painted with an ordinary paint which turned yellow and the light in the room was measured each day for several weeks. Afterwards the same ceiling was coated with a glossy white paint and the same identical tests repeated for several weeks. The figures were compared, and sunny days the difference between the old and the new was not less than 19 per cent. at any time, and dark, cloudy days there was a difference as high as 36 per cent. This shows conclusively that in any mill or factory it is possible to greatly improve light by reflecting and diffusing throughout the entire room every ray of light which enters at the windows.

From the standpoint of cost it can be seen that fewer artificial light units will be needed if the ceiling be a glossy white, because such a surface really acts as a great light reflector.

Where the inverted system of lighting is used, results are usually good, because of the light reflection. The writer knows of a very large plant which has recently installed their own inverted system of lighting, and as a part of that system the ceilings were coated with a glossy white paint, and the results therefrom are remarkable.

There are incidental advantages to be gained by having ceilings and walls finished as above described, such as added sanitation, for a glossy paint sheds dust and dirt, and it is possible to keep it clean from soot and belt-flyings.

There is one point to bear in mind when considering the painting of ceilings with a full gloss paint, and that is to beware of paints which are liable to crack, and possibly fall in flakes. It is possible to obtain glossy, pure white paint not made from varnish, and which is as durable as oil paints.

FANCY ROLLER ATTACHMENT FOR REVOLVING FLAT CARDS

The high price of cotton has led manufacturers to give much more attention to economy of waste. Many uses have been found for the various grades, some of which it was once thought could not be economically manufactured by the regular processes of cotton machines.

The first difficulty encountered in the attempts to card waste was in producing a good sliver from the card. The cylinder would load up and would not properly deliver the carded stock to the doffer. This difficulty has been overcome by the fancy roller attachment recently perfected by the Saco-Pettee Co., Newton Upper Falls, Mass. This is applied to the card between the flats and the doffer, as shown in the accompanying illustration. With this attachment grades of cotton waste and other fibrous materials which practically could not be formed into a good sliver on the card may now be carded, drawn and spun and at the same time the fancy roller effects a material saving in labor. Its action is continuous. Whereas it was customary to strip four or five times a day when carding waste, with this attachment the card cylinders need stripping only once a week when cleaning down. The doffers should be stripped twice a day, but this can be done while the card is at work so there is no loss of production in stopping the cards to strip.

Experience has proved that any grade of waste that can be carded and formed into a sliver and coiled into a card will go through the regular processes of drawing and spinning successfully with this attachment. With the use of this fancy roller it has been found possible to produce good, coarse yarn from some of the lowest grades of waste which had not hitherto been successfully handled on the regular line of cotton machinery. The Saco-Pettee Co. have had considerable experience in the handling of waste and would be pleased to hear from manufacturers who are interested in this subject.

WASTED HUMIDITY

By J. W. H. MYRICK, Ventilating Engineer

I am frequently asked how to get better ventilation and a lower temperature without destroying the humidity. In our textile work it has struck us rather forcibly that a great deal of study is being given to the proper humidification and ventilation equipment of spinning and weaving rooms, but too much attention is given to inside conditions without taking the outside atmospheric conditions and currents of air into consideration.

For instance, in one mill we examined sometime ago they had a large number of heads to supply and maintain a certain amount of humidity in connection with a number of blowers to supply the proper amount of heat; in making a test of this room we found they wished to maintain an average humidity of 60. The result was that they had a humidity of about 40 on one side of the building and over 80 on the other; the low humidity was on the windward side, which was to the westward; the building running exactly north and south. It was a brisk, cool day, the latter part of February, and about half past one in the afternoon. The wind velocity was

THE SAGO-PETTEE FANCY ROLLER ATTACHMENT FOR REVOLVING FLAT CARDS, PAGE 618.

16.5 miles per hour, the humidity was about 30. As the sun's rays struck on about one-third of the floor space of the mill, it naturally had some effect on the inside conditions, and the infiltration and inleakage of the air through those windows on the inside naturally had a tendency to bring the outside humidity conditions into the mill, and now on the shady eastward side or lee side was naturally much cooler. All the air being forced into this spinning room on some known basis of requirements had no definite and known place of exit, so that the condition therein was a plenum, so strong that the pressure was almost noticeable to a layman. This natural suction on the lee-side had a tendency to bring forth the heat and humidity conditions to that point of exit. As stated before, there was no way for this heat forced in and created by the machinery to flow out or free itself except by the leaks afforded by the cracks and crevices about the windows.

It strikes the writer as being almost as essential in trying to standardize certain conditions within the room, as essential to arrange for an outlet as to allow for or lay out a plan for the introduction of a certain amount of air supply with the heat; the result was, as I could very easily see, condensation on the walls of the eastward side with a much higher humidity then they wished, and a natural lower humidity than desired on the sunny side, also the windward side to the westward. Now in the weave shed they had through the center, 30-inch swinging cowls on the peak of the sawtooth. They were forcing into this room a certain amount of humidity and heat which had a tendency to make a short cut to this cowl outlet, thereby losing a large amount of the element that they were sending in at an expense to create and maintain a certain condition. To overcome this difficulty, I advised one of the cotton mills the other day to pipe from the bottom of our Autoforce air pump or so-called ventilator down into the room alongside of a post or stanchion, or wherever convenient, to within about three feet of the floor, so that the increased outward suction created by the Autoforce air pump would be forced to draw from this point and thereby bring this humidity down on the looms on the working plane and make it perform its duty before it was allowed to escape from the shed.

In another case, one of the mills had humidity heads under air pressure; these jets of moisture were pointed towards the ceiling and with the outlets in one case nearly over the same with a pressure behind this spray, the draught created by the exhaust head on the roof naturally had a tendency to take a lot of this element directly out through before it had benefitted the condition of the room, thereby creating a lot of waste and letting the air from other sources come into the room, which naturally would carry a humidity of whatever the outside atmosphere furnished. On very dry days this was found to materially weaken the strength of the line of goods that they were producing

We are sometimes asked why the Autoforce air pump or ventilator has any special advantage over the swinging cowl which sells for about $1 an inch whereas the Autoforce sells for about three times as much. The swinging cowl on a sawtooth roof has a fairly good displacement, because of the closed end toward the wind, and a free exit to the leeward, equal to, or larger than the diameter of the stub; but when the wind currents flow below normal, say six or seven miles per hour, the cowl has but very little, if any, natural displacement because of its failure to be able to harness that low velocity, and any excessive heat created by the sun's rays only helps to handicap the natural ventilation created by the greater heat within than without the building. The sun's rays beating on a sawtooth roof has a tendency to create and maintain an excessive heat in the peak like what is experienced in the eaves or attic of a building. This, in our opinion, acts as a hot air pocket and if hotter than the air in the weave shed in this instance, unless there is a high velocity of wind, it very greatly retards the ventilation.

Of course the machinery in the winter

time generates a lot of heat and even in the southern climate the outside air during a great many months of that season is a much lower temperature, and naturally the cowl will give fairly good satisfaction, but we not only claim a greater displacement for our device in comparison with the swinging lobsterback elbow, or cowl under the most favorable conditions for the latter, but we do claim the harnessing of the air currents so that we are able to create and maintain a known and even displacement. Our figure is estimated on an eight-mile velocity per hour. The average wind velocity as given by the United States Government report shows about fourteen miles per hour, thirty-five feet above the earth's surface in an unpocketed, uninterrupted air current. That does not mean that no movement or at sometimes a possible sixty miles at another, it means practically nothing less than four miles per hour at any time, and such au-authority as Lord Kevlin and Prof. Agassiz have never been able to get a lower record than two and a half miles per hour.

The principle claim for the Autoforce is that instead of the sun's rays being a handicap when the ventilation is most needd, it is one of the elements that have been harnessed as to be of material help to the air pump, instead of in any way being a handicap.

In one test that we made with a well known engineer it was found that the Autoforce air pump, although not set in a most favorable position, showed but very little number of cubic feet of air increase in the different wind velocities between about a five to ten mile air movement, in other words, when the air currents had practically doubled themselves there was a slight increase, carrying out the claim of being able to maintain an equal displacement.

To go back again to the question, how to get better ventilation and a lower temperature without destroying the humidity, I should endeavor to eliminate the effect of the ceiling heat and remove the air at the point where the humidity will be forced to accomplish its purpose before being drawn out by the air pump. Knowing the displacement in cubic feet with the Autoforce pump we are able to make an exact estimate of how much air needs to be removed in proportion to that allowed to come into the mill.

This system is in use in a number of important textile mills, including the Greylock and the Berkshire Mills, Bernon Mills, Saxony Worsted Mills, Warner Cotton Mills, at Newburyport, Abbot Worsted Mills, and has recently been specified for some new construction at the Pacific Mills and the Saco-Pettee Works. Outside of the textile line the Autoforce ventilating system is used by some of the great industrial concerns like the International Harvester Co., Standard Oil Co., the Armour Co., and others. It is manufactured by the Autoforce Ventilating System, 52 Devonshire St., Boston.

MILL NEWS

*Pennsylvania, Pittsburg. While the report that the Valley Yarn & Woolen Co. of East Brady has purchased a manufacturing site at Pittsburg is correct, the concern will not decide until fall whether they will move to the new location. All grades of wool knitting yarns are manufactured, from 1-5 to 2-30 cuts, on 2 sets of cards and 720 spindles. R. T. Neal is the treasurer and buyer.

*Rhode Island, Pascoag. The plant of the Clear River Mills on North Main St., which has been idle for about two years, has been leased for a period of three years by the Premier Worsted Co. of Wickford. About 100 hands are employed and it is said that the company will move its machinery to Pascoag on the expiration of its lease in September.

Rhode Island, Pawtucket. The mills of J. & P. Coats, Ltd., will be closed August 19 to September 6 for the annual vacation to operatives. As noted, electric power equipment is being installed in No. 4 Mill and good progress is being made on this improvement.

Rhode Island, Providence. The Continental Worsted Co. is running day and night and to care for its business is having goods woven on commission in three other plants.

Rhode Island, Providence. The Windham Mfg. Co. of Willimantic, Conn., and the Quidnick Mfg. Co. of Coventry, R. I., have been merged into the Quidnick-Windham Mfg. Co., a Rhode Island corporation with authorized capital of $1,000,000. The combined plants have 84,000 cotton spindles and 2,000 plain and fancy looms. $250,000, 7 per cent. preferred stock is being offered for sale. Jeffrey Davis, Providence, is president of the company, and J. H. Hambly, also of Providence, is treasurer. The directors include Francis W. Carpenter, president of Congdon & Carpenter Co., Providence, Walter B. Knight, agent of the company, Willimantic, and Hugh C. Murray, president of the H. C. Murray Co., Willimantic.

Mill News

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires, facts and gossip of the trade are referred to the TEXTILE ADVANCE NEWS, issued weekly by the publishers of the TEXTILE WORLD RECORD, at $15.00 per year.

COTTON.

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New Mills.

*Connecticut, Killingly. It is said that the new $500,000 company soon to be incorporated as the Killingly Mfg. Co., will take over the Williamsville Mfg. Co.'s plant recently sold by the Atwoods and which has been idle for some time. According to the report, a new weave shed will be erected and general improvements be made in the property, which is to be used in the manufacture of fine shirtings. Francis E. Tucker and George Bullock, of Providence, are named as among the parties interested financially.

*Connecticut, New Hartford. The Draycott Mills Co. has been incorporated, with a capital of $1,000,000, 10,000 shares par value $100, to manufacture fabrics, including bobinette. The incorporators are Henry H. Perry, president; Walter D. Loring, treasurer; Jas. E. Carroll, clerk; Francis S. Beckford and Wm. H. Best.

New York, Albany. The Rochester Thread Co., of Rochester, has applied for a charter, with a capital of $30,000; with Theo. Barnard and M. L. Schelling as incorporators. They will handle linen and cotton threads.

North Carolina, Barclaysville. According to advices the Hartnett Mfg. Co., recently incorporated with capital stock of $25,000, will establish a plant for the manufacture of cotton yarns and cloths. A. B. Currin, W. J. Alston and Sandy Adams, a lumber dealer of Barclaysville, are the incorporators.

*North Carolina, Mt. Holly. It is stated the promoters of the Energetic Mfg. Co. will not undertake to begin construction work on buildings for several months. Geo. A. Howell of Charlotte, formerly superintendent of the Chronicle Mills and the Imperial Yarn Mills of Belmont, heads the project and has had plans prepared for a 5,000-spindle mill, 71 by 300 ft., to be equipped for manufacturing 70s to 120s cotton yarns, the equipment to be driven by electric motors.

*North Carolina, Salisbury. The Vance Cotton Mills report that while it was their intention to build a new mill for the manufacture of fine yarns, they have been delayed and there is a possibility that their plans may be changed.

Pennsylvania, Philadelphia. The two story building in the rear of 2766 Ruth St. has been leased by parties by the name of Stevenson and Ward, who have purchased four looms on which they will manufacture summer curtains of plain and mercerized yarns.

Pennsylvania, Philadelphia. N. W. Otto has leased a portion of the first floor at 2013-15-17 E. Arizona St., which he has installed two looms on which he will start up the manufacture of cotton and mercerized summer curtains, using two and three ply yarns. Samples have been made up and put on the market and the plant will be greatly enlarged when orders come in.

*Pennsylvania, Philadelphia. Cotton and mercerized madras and gauze curtains will be manufactured by Thomas J. Bibby, who has installed four looms in the third floor of the building at 2627 Mutter St., and will use 1/40 cotton, and 2/12 and 2/16 mercerized skeins and 80/2 warps. The production of the plant will be sold direct.

*Rhode Island, Pawtucket. The B. F. Smith Co. has begun work toward the construction of buildings for the new Crown Mfg. Co. Particulars have been given previously.

*South Carolina, Greenville. The Westervelt Mills, the buildings being about completed, will begin the installation of machinery probably the latter part of August. This 50,000-spindle mill will make fine lawns and linens from combed yarns.

*Tennessee, Knoxville. The Knoxville Spinning Co., recently organized, and which have taken over part of the Knoxville Woolen Mills plant, will begin the production of 18/1 and 20/1 hosiery yarns about Oct. 15 to Nov. 1. The company has a capital of $50,000, 10,000 spindles are being installed and about 150 will be employed.

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Enlargements and Improvements.

Canada, Ontario, Toronto. The Smith Manufacturing Co., operating plant on shoddy, cotton batting and wadding, is building a large addition. They expect to have the new machinery installed and in operation by the end of August.

Illinois, Aurora. The Aurora Cotton Mills have been shut down indefinitely and advantage will be taken of the opportunity to make extensive repairs. It is said that at least $50,000 worth of new machinery equipment will be installed.

Massachusetts, Lowell. A permit has been issued by the inspector of lands and buildings for the erection of a power house for the Lowell Bleachery, 67 by 30 feet, of one story, to cost about $7000, to be located between buildings 13 and 14, and to be connected with buildings 5 and 24 by two large platforms.

*Missouri, Kansas City. The Kansas City Cotton Mills Co. will be ready to resume manufacturing about September. Good progress is being made on improvements and they are nearly finished, with the exception of building the warehouse shed. As noted, bonds of $250,000 have been issued to make improvements, liquidate indebtedness and provide working capital. The new officers are Louis Seibel, president; E. E. Holmes, secretary and treasurer; Spencer Turner, manager, and Wm. A. Otto, selling agent.

Rhode Island, Crompton. Report is confirmed by C. D. Robinson, superintendent, that the Crompton Co. is to begin at once the erection of the addition to their cutting department. As stated last week, this will be a building of three stories, 133 by 60 feet, to be located in the town of Warwick.

South Carolina, Fairmount. An addition of 1,536 spindles and 40 looms is being made to the equipment of the Fairmount Mfg. Co., which will give a total equipment of 12,000 spindles and 340 looms. H. B. Jennings is president, Frank E. Whitman, treasurer, and R. P. Sweeny, superintendent.

South Carolina, Greenville. The addition of a new cloth room is to be made to the plant of the Monaghan Mfg. Co., work on the foundation having already been begun and the work is to be rushed. The old cloth room will be used as a weave room with 86 broad looms.

South Carolina, Greenwood. Two thousand additional spindles have been ordered by the Grendel Mills and will be installed during August.

South Carolina, Graniteville. Contracts have been awarded by the Graniteville Mfg. Co. for improvements in its power plant and the addition of new machinery, including spinning frames, cards and speeders.

*South Carolina, Greers. Contract has been awarded by the Greers Mfg. Co. to the Gallivan Building Co. of Greenville, for the erection of a 4-story building, 110 by 130 ft., and a second building, 2 stories high, 110 by 100 ft. 15,000 spindles and 450 looms will be installed when the enlargement is completed, giving total equipment of 25,000 spindles and 700 looms. All contracts have been awarded.

*Texas, Cuero. Work on the enlargement of the Cuero Cotton Factory is progressing, and improvements on the company's Guadalupe River dam will soon be started, to include the substitution of three 56-inch wheels for two 52-inch turbines to furnish a necessary increase in power.

South Carolina, Whitmire. The Glenn-Lowry Mfg. Co., will change from steam to electric power and has contracted for 1,500 electrical h. p. from the Southern Power Co. A meeting of stockholders will be held July 22 to vote on a proposition to increase the capital.

Vermont, Burlington. Extensive repairs are to be made to the Queen City Cotton Co.'s plant. Included in the renovations will be a new roof on the weave room.

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Mills Starting Up.

Alabama, Cordova. The Indian Head Mills, who are said to have been shipping a large proportion of their product of sheetings to China, have resumed after being closed for a few weeks.

Massachusetts, Salem. Operations have been resumed at the Naumkeag Steam Cotton Mills, which were closed for two weeks. It is expected that the plant will now run steadily until Christmas.

WOOLEN.

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New Mills.

Canada, Ontario, Milbank. It is reported that A. F. Smith is to operate a small woolen mill at this place.

*Massachusetts, Franklin. The Clark-Cutler-McDermott Co. has been incorporated to operate the new blanket mill to be established here. William Cutler is president of the new company; Thomas S. McDermott, vice-president; Walter A. Clark, treasurer and Wendell Williams, secretary. The machinery has been purchased and will be set up as soon as building is ready. It is hoped to have the plant ready to start operations early in the fall.

*Massachusetts, Lawrence. In about a month outside work on the new Uswoco Mill will be completed. The roof is partly on on the northern end, where the building has been erected to its full height, seven stories. As noted previously, this mill will be leased by the United States Worsted Co. and will be equipped with 600 looms for weaving fine worsted men's wear and dress goods.

*Pennsylvania, Philadelphia. The Ferguson Carpet Company, with a capital of $50,000, Norman Cramp, president, Lincoln Ferguson, treasurer, and B. Knifton, superintendent, one of the new companies recently incorporated in this town, has installed machinery consisting of 20 looms which are being operated on velvet carpets. The company prints and finishes and sells the product through New York.

Pennsylvania, Philadelphia. An application will soon be made for a charter under the laws of this state for the Continental Eiderdown Co., the incorporators being Wilson H. Brown, Stanley R. Stager and E. K. Ring. The company will have a capital of $25,000 and will commence its operations in a portion of the buildings formerly operated by the Leicester & Continental Mills at Lena and Armat Sts., Germantown, the equipment of the plant being recently purchased at the sale of the effects of the latter company. Arthur J. Unsworth, formerly superintendent and manager for the old company, will have charge of the new plant and the production will be sold through Brown & Bowers, who are well known as dealers in woolen and worsted yarns at 41 Strawberry St.

Washington, Ellensburg. It is reported that J. F. McAfee of Topeka, Kansas, is interested in establishing a plant at this place, and proposes removing either one of the mills in which he is interested to this place if sufficient support is guaranteed.

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Enlargements and Improvements.

Connecticut, Mechanicville. An order has been placed with the General Electric Co. by the French River Textile Co. for one 500 k. w. turbine, one 200 k. w. generator, and one 200 h. p. induction motor, this apparatus to be for the joint use of the French River Textile Co. and the Putnam Light & Power Co.

*Maine, Houlton. Work has been started on the addition to the Houlton Woolen Mills, the foundation for which was built last fall. In connection with this increase bonds were issued to the amount of $30,000. The addition will measure 60 by 116 ft.

*Massachusetts, North Andover. Work on the installation of the new boilers in the Sutton Mills is progressing rapidly and will be completed this week and the plant will resume manufacturing July 10.

*Massachusetts, Pittsfield. According to official report, it is hoped to have the new addition to the plant of the Berkshire Woolen & Worsted Co. in operation by the middle of September. This is to be of brick, 68 by 80 feet, and new carding and spinning machinery will be installed, the whole to represent an expenditure of about $70,000.

Massachusetts, Warren. During the shutdown of the Sayles & Jenks Mfg. Co. from July 1 to July 5, the boilers were repaired and some other necessary changes made in addition to the taking of the quarterly account of stock.

New Jersey, Trenton. Some repairs and improvements are being made to the buildings of the Princeton Worsted Mills. The plant is operating overtime.

*New York, Amsterdam. The land recently purchased by McCleary, Wallin & Crouse, Inc., the large rug and carpet manufacturers, will be used for the erection of a 7-story iron and concrete warehouse, 200 by 80 feet, at the terminus of the New York Central branch now running to the company's property.

Oregon, Eugene. Before the end of the year the Eugene Woolen Mill Co. will begin the manufacture of cassimeres, serges, cheviots and other fabrics for men's wear and dress goods, while the present lines of blankets and flannels will be continued. Since the first of the year one set of cards, a new mule and new finishing equipment have been installed. Business is reported to be very good on the old lines manufactured.

Pennsylvania, Philadelphia. Lawrence Collins, manufacturing ingrain carpets on 25 looms at Howard St. and Lehigh Ave., has opened up a branch mill at Front and Norris Sts., where he has installed 12 hand looms which are being operated on rag carpets, for which there seems to be quite a demand at the present time.

Pennsylvania, Philadelphia. Estimates are being asked on a proposed factory building to be erected for A. J. Cameron & Co., at Pacific St. and Glenwood Ave., where they are manufacturing worsted yarns on the Bradford system with 10 combs, 12 cards and 9,000 spindles. The company also operated the Harrowgate Spinning Mills at Emerald and Westmoreland Sts., containing 3,000 spindles on the same kind of yarns.

Rhode Island, Greenville. A new Parks & Woolson shear has been installed by the Stillwater Worsted Co. Both the looms in the Stillwater mill and the Windsor mill, the latter a branch of the Stillwater company, are running night and day as usual.

Utah, Provo. The Knight Woolen Mills have a large part of their looms in operation on flannels, and are getting out a very attractive line of samples for the lightweight season from which good results are expected. They have recently received a number of machines from the Southwark Mills of Philadelphia for various departments.

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Mills Starting Up.

Connecticut, Plainfield. The woolen mills at Moosup, Killingly, Putnam and Thompson have resumed on full time, as well as the smaller mills in the vicinity. The outlook in that neighborhood is better than in many other sections.

New York, Jamestown. Operations have been resumed in the Odsonia Mills, which have been closed since July 3rd., for purpose of making repairs and taking inventory. A 34,000 gallon water tank has been placed, for furnishing water pressure for the water to be used in the new dye house recently completed. An entirely new electric power system is to be installed, and the old motors discarded. They are also putting in a 1000 h. p. steam turbine engine and two new tubular boilers.

*Rhode Island, Woonsocket. The new building of the Rathbun Knitting Co., to be used as a spinning mill, has been completed and the machinery is now being installed, 3 sets of woolen cards, 4 mules, 1440 spindles, which will be used by the company in spinning its own woolen yarns.

Rhode Island, Woonsocket. The Paragon Worsted Co. of Providence has started the finishing department of the Sayles & Prendergast Mill on S. Main St., formerly occupied by the concern, and will give employment to from 20 to 25 hands for a period of from 2 to 3 months or longer if occasion demands it. A few months ago the Paragon Worsted Co. removed from Woonsocket to the Earnscliffe Worsted Mills at Providence, and the starting of the old plant in Woonsocket is due to their having a larger number of orders than the Providence plant can turn out. It is possible that other departments of the mill here may be started.

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Mills Shutting Down.

Pennsylvania, Aston Mills. The May Mfg. Co., with a capitalization of $200,000, P. H. Corr, pres., operating 24 sets, 394 looms on piece dyes, cotton worsteds and cassimeres which they dyed and finished and sold through New York, has been shut down, the owners, it is said, reporting that they will not start it up again until business is in a more satisfactory condition.

Pennsylvania, Philadelphia. Chas. Porter & Sons, it is reported, have shut down their plant at Howard and Norris Sts., in which they manufactured men's wear on 350 looms, for an indefinite period. Another report has it that this concern, when it does start up again, will change its equipment from narrow looms to broad looms.

Pennsylvania, Philadelphia. George Klenk, for many years located at Trenton Ave. and Auburn Sts., where he manufactured woolen and merino yarns on 3 sets, 2,300 spindles, has shut down his plant and is now located at Leverington Ave. and

Wilde Sts., Manayunk, where he is connected with the new woolen spinning plant recently reported as being started up by Milton Kerkeslager. The prospects are that Mr. Klenk's plant will not be started up again.

KNIT.

New Mills.

Canada, Ontario, St. Thomas. Operations have been started in the new plant of the Monarch Knitting Co., Ltd. Fancy knit goods, sweaters, lumbermen's socks, etc., are made.

Canada, Quebec, Beauce Junction. The National Knitting Co., Ltd., has been formed to manufacture underwear, sweaters, hosiery, etc. It has a capital of $20,000 subscribed and about 25 knitting machines will be installed and a dozen sewing machines. It is expected to begin operations about Aug. 1. Joseph Asselin is president.

*Illinois, Chicago. The Eagle Hosiery Mills, 1935 West 13th St., have started manufacturing. This is a new concern which has equipped a plant for making lisle, mercerized and silk hosiery with 10 knitting machines. H. M. Kahn is president and manager; H. Gutman, treasurer, and Ernest Petersen, secretary.

Kansas, Topeka. The Textile Mfg. Co., a new concern organized to manufacture men's union suits, has established a plant at Neil and Green Sts. Spring needle knitting machines have been installed and the plant is equipped for bleaching. The officers are L. Strauss, president; C. Strauss, vice-president, treasurer and superintendent, and M. A. Stern, secretary.

*New York, Gloversville. The new factory of Geo. C. Holmes at 16 Lincoln St. is operating 8 knitting machines on silk veils, scarfs, gloves and lace mitts. Mr. Holmes is proprietor and buyer.

*New York, Oswego. Work has been completed on the mill building for James A. Shufelt and according to reports equipment will be installed ready to begin manufacturing about September 1. Leon Shufelt will be general superintendent. Late in 1910 Mr. Shufelt purchased the Campbell greenhouse property for manufacturing site and in April began the construction of a 3-story mill to be equipped for manufacturing men's union suits. A corporation will be formed with capital stock of $40,000 and James A. Shufelt will be president and treasurer.

New York, Walton. A knitting plant is to be located on the top floor of the factory building owned by James Munn by a new corporation known as the White Rock Knitting Co., recently chartered with capital of $15,000. The directors are Herbert Shaw, Paul Nichols, James Munn and C. G. Robinson.

New York, Walton. The White Tock Knitting Mills Co. has been incorporated with a capital stock of $15,000. Herbert Shaw, Paul and C. G. Nichols, James Mann and Percy Strong are the men named as directors and those interested.

*North Carolina, Durham. Work has been started on the rebuilding of the mill of the plant of the Chatham Knitting Mills Co., recently destroyed by fire. They have 70 machines on hand and expect to put in about 50 additional machines later on. The new mill will be 33 by 125 feet, of frame construction, with metal roof, and according to plans will be completed by July 25. The concern has a capital stock of $22,000, all paid in, and manufactures hosiery in the gray, operating equipment by a gasoline engine. J. H. Stone is president and superintendent and W. T. Cole is treasurer and buyer. The plant was practically destroyed a little over a month ago by fire, caused by a severe storm which blew down trolley wires and wrecked several buildings.

*Ohio, Cleveland. The new mill for the Greene-Haas-Schwartz Co., manufacturers of sweater coats, shawls and fancy knit goods, is completed, and they will add some new equipment. The new mill contains six floors and basement and has a total of 75,000 sq. ft. of space. This company succeeded S. Schlesinger Knitting Co. about a year ago.

Pennsylvania, Allentown. It is reported that a new knitting plant is to be established here by Alfred S. Knecht. A building, 24 by 100 feet, has been reported leased on Melrose Ave., and some of the equipment already installed. The balance of the machinery will be added after the plant has started operations.

*Pennsylvania, Bangor. A charter has been granted the Bangor Silk Knitting Co. with capital stock of $5,000. This refers to the new company which it has been previously reported would be organized by H. M. Hagerman and E. Phillip Keenan to establish a silk knitting plant here. A lease of the unoccupied part of Music Hall will probably be secured for the present quarters, although the men interested plan eventually to erect a mill especially planned for manufacturing. The new company will probably manufacture hosiery.

Pennsylvania, Philadelphia. A plant for manufacturing and finishing hosiery has been equipped at 1645 N. Tenth St. by the Clinton Mfg. Co., containing 26 latch needle knitting machines, 8 sewing machines and 2 loopers. At present they are buying hosiery of all kinds in the grey, finishing the goods and selling direct. It is expected the new plant will be started shortly.

Pennsylvania, Philadelphia. Smith & Lauber, recently reported by us as about to engage in the manufacture of hosiery, have given up the project and are now looking up machinery for the equipment of a plant for the manufacture of high grade silk neckties. Mr. Smith's address is 5730 Greene St., Germantown.

Pennsylvania, Boyertown. It is reported that a company will soon start up a plant here for the manufacture of gloves. It is not known whether knit or other kinds of gloves will be made.

Pennsylvania, York. A. J. Hilliker, James C. May and Geo. D. Schriver are reported as interested in the Manhattan Hosiery Co., recently reported incorporated with capital stock of $10,000.

*Virginia, Suffolk. The Carr Mills have awarded contract for the erection of their building which will be 100 by 40 ft. As noted in June, this company has been incorporated with capital stock of $50,000 and will manufacture hosiery with 30 knitting machines, beginning operations about August 1. Fine gauge men's and ladies' goods will be made from yarns ranging from 2/34s to 2/70s mercerized and 1/50s to 1/80s combed. The machinery will be operated by electric power. G. L. Bell is president; E. A. Everett, treasurer, and J. O. Carr, manager and buyer.

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Enlargements and Improvements.

*Canada, Ontario, Woodstock. Work has been started on the construction of the new buildings for the Kerr Knitting Co., Ltd. The plant will be eqiupped for electricity. It is expected to begin operations some time in October.

*Indiana, Fort Wayne. It is probable that the new addition to the Wayne Knitting Mills will be finished and ready for equipment by midwinter. The concrete foundations are being put in and orders for the machinery to be built abroad have been placed. The new addition will be 45 by 145 feet and connected to the main building by an ell.

*New Hampshire, Hillsboro. The new Contoocook Mills Corporation of Massachusetts, capital stock $750,000, divided into $500,000 of preferred and $250,000 common stock, has taken over the plant of the Contoocook Mills Co., manufacturing underwear and hosiery. Harry L. Burrage is president, Wm. P. Bailey, treasurer, and I. M. Taylor and W. F. Brown are also interested. C. A. Jones will continue as superintendent. Enlargements and improvements will probably be made to the plant, including the development of the water power.

New Jersey, Dover. It is reported that work will soon start on an addition to the plant of Paul Guenther, Inc., which is operating on men's and women's full fashioned silk hosiery.

New York, Hudson. The mills of the Swansdown Knitting Co. are closed for a time. The company is putting up a new building to be used for picking, carding and spinning, and the shutdown is for the purpose of moving the machinery into the new building and installing rope drives for power transmission.

New York, Ilion. The Sterling Mills are putting in Grosser automatic machines to manufacture high grade sweater coats. They already make a popular line of medium wool and worsted coats.

*New York, Oswego. Good progress is being made on the erection of the 50 by 75-ft. addition to the plant of the Lastlong Underwear Co., which is to be equipped as a bleachery. This enlargement will be completed during August. H. A. Baker is president and K. H. White, treasurer and superintendent.

*New York, St. Johnsville. Work on the new addition to the Royal Gem Department of the Union Mills is under way. This will give employment to some 200 extra hands, on women's cotton knit underwear, although the number of machines to be operated at first has not been definitely decided.

*Pennsylvania, Milton. It is reported that the Susquehanna Silk Mills, which recently purchased the plant of the Sidney H. Souter Silk Co., will increase the capacity of the plant and make other various improvements.

Pennsylvania, Philadelphia. The Royal Knitting Mills Co., 1427 Catherine St., which has been manufacturing sweaters, gold vest and knitted silk neckties, have recently installed machinery for the manufacture of Jerseys and bathing suits. Samples have been put on the market and a large number of new machines for this department will be added within a short time to enable them to fill their orders which are now coming in large quantities. They are using cotton, wool, worsted and silk yarns; B. Robbins being the president, treasurer and buyer.

*Pennsylvania, Reading. The fire loss of Geo. W. Hawk Co. has been adjusted at $19,000 on stock and $16,000 on equipment, a total of $35,000. The company advises that plans will be made at once for manufacturing in temporary quarters until the burned mill is rebuilt.

Tennessee, Rockwood. At the annual meeting of the Rockwood Mills (hosiery), a dividend of 15 per cent. on the capital stock was declared, and an appropriation of $10,000 was made for a new box factory, work on which it is reported will begin at once. It is also said that new knitting machinery will be installed. At the election of officers, all of the old board were returned. This company now operates 100 knitting machines and 173 ribbers on women's ribbed and children's and infants' hosiery.

Connecticut, South Manchester. Another enlargement will be built at the plant of Cheney Bros., which will be in the form of extensions between buildings 1 and 2 and 2 and 3, 4 stories high, 28 by 56 ft.

New Jersey, Paterson. P. Collins, Washington and Fair Sts., has leased more space and will install additional looms. The first installment to be added will consist of six looms.

New Jersey, Paterson. The Liberty Silk Mills, formerly located at 93 River St., have moved their plant to 1738 N. Second St., Philadelphia, where they have purchased a plant of 60 looms which will be combined with their original equipment. The plant in Philadelphia which has been purchased is the one formerly operated by Frank F. Wolgamuth on silk fabrics and cotton goods.

New Jersey, Paterson. A new broad silk plant of 10 looms is being established at 93 River St. by Platt Bros.

New Jersey, Paterson. A concern known as the Pelican Silk Co. has leased space in the Strange Mill No. 5 and is installing 20 broad silk looms. It is planned to have total equipment of 40 looms if the enterprise is successful.

MISCELLANEOUS.

Connecticut, Hartford. The business of the Hartford Thread Co., 228 Market St., has been purchased by the Bay State Thread Works of Springfield, Mass. This concern manufactured cotton threads on spools, tubes and cones for manufacturers' use. The equipment will be moved to Springfield and the local plant discontinued.

*Connecticut, Norwich. It is reported that plans are being prepared for the new velvet ribbons plant proposed some time ago by Giron Freres, of St. Etienne, France.

*Florida, Jacksonville. In June a report was given of the project of S. S. Goffin to establish a plant for manufacturing cotton and burlap bags. Mr. Goffin has formed the Goffin Bag Mfg. Co. with capital stock of $50,000 and work has been started on a building which is to be completed about August 1. Goods will not be woven, the material being purchased in the market.

*Maine, West Kennebunk. A steam power plant is being installed in the plant of R. W. Lord Co., to insure plenty of power all the year round. It was reported last December that the company was handicapped for lack of water power.

Massachusetts, Amesbury. The National Rug Co., which recently bought out the felt rug department of the Merrimac Hat Co., has established a factory at 99 Friend St. Fifteen looms will be installed immediately and 50 hands employed. A Mr. Shakin of New York is the proprietor.

Massachusetts, Fall River. It is understood that an out-of-town firm will establish a braid-making plant in the building of the George Cummings & Sons Co. on Bower St., Globe. Floor space is said to have been let and electricity will probably be used for power, as new wires are being run into the building.

Massachusetts, Westboro. The Hunt Metal Corner Co. is removing to its new shop and looms will be installed by Joseph S. Mason in the space being vacated. Mr. Mason states that his machinery will all be set up about the middle of July, when he will have a total of 72 looms.

Missouri, St. Louis. A company has been organized with capital stock of $50,000 to establish a plant in St. Louis for manufacturing fish nets. Three floors at 410 North 2d St. have been leased from Chas. W. Martin & Co.

New Jersey, Paterson. The Paterson Silk Dyeing Co., 16 Bridge St., has been incorporated with capital stock of $50,000. Morris Cohn and Joseph Monzo, of Paterson, with Alfred La Forte, Passaic, are mentioned as interested.

*Ohio, Cleveland. Stanley Stanewicz, one of the stockholders of the Eureka Worsted Mills Co., incorporated about a year ago, has brought suit for a receiver and judgment for all money not now in the treasury. The petitioner alleges that no business was ever transacted and that no stockholders' meeting has been held since the organization of the company, also that officers have drawn good salaries which were paid out of stock subscriptions. The Eureka Worsted Mills Co. was incorporated in April, 1910, with capital stock of $100,000 and organized with W. S. Thorpe, president; M. G. Corbley, vice-president, and M. J. Flannagan, formerly connected with the Cleveland Worsted Mills Co., secretary and treasurer. It was proposed to manufacture worsted knitting yarns at first and later to install a weaving department. Negotiations were entered into with Boards of Trade of various cities looking to the securing of concessions for the location of the proposed plant, but nothing was ever accomplished. It is probable the corporation will be dissolved.

Ohio, Lockland. The Stearns & Foster Co. is arranging to remove their offices, now at Cincinnati, to the plant at this place. For the purpose, a new building 100 by 70 feet, two stories and basement, is being erected.

Oklahoma, Chickasha. The Chamber of Commerce is trying to interest manufacturers in starting the Oklahoma Cotton Mills, the underwear plant established here about a year ago by the citizens of Chickasha. The plant has never been put in operation, largely on account of the fact that no one connected with the organization of the company knew the business, and the man engaged to set up the machinery, which was a secondhand outfit, proved to be incompetent and unreliable. Much of the machinery has never been erected, although the mill building has been completed nearly a year. The equipment includes a steam and electric power plant, 4 sets of cards, 62 knitting machines, 50 sewing machines, etc.

Pennsylvania, Allen. Alfred Musselman, the purchaser of the Allen Knitting Co. at the recent receiver's sale, will not operate the plant. Mr. Musselman purchased for investment and offers the property for sale as a whole or in part. The mill has been idle for about a year.

Pennsylvania, Chester. A charter has been granted the Robert E. Clark Thread Manufacturing Co., with a capital of $50,000. This company, which is located at 126-28 E. 6th St., has for its officers George Shober, president, and Robert E. Clark, secretary and treasurer, and manufactures sewing threads and spool cottons, also cones, tubes and spools, 200 to 12,000 yards. The plant is very busy and recently many changes have been made in its equipment, both in the way of motive power and general equipment for the purpose of allowing them to increase their output. The business has grown largely since it was established about two years ago.

Pennsylvania, Philadelphia. The Wingohocking Hosiery Mills on Penn St., Germantown, manufacturers of seamless hosiery, sweater coats and cardigan jackets, with 400 knitters and 100 sewing machines, formerly operated by the late firm of George Peberdy's Sons, has been taken over by Chas. Peberdy & Son, who reports that the cardigan jacket and sweater coats departments are being operated at present. The hosiery department will not be started up until that branch of the business is in a more satisfactory condition.

Personals

S. T. Butterworth, superintendent of the Baltic Mills Co., Baltic, Conn., has been appointed superintendent of the Lawton Mills Corporation, Plainfield, Conn.

James Hendry, who has been designer and assistant superintendent at the Jewell Brook Mill, Ludlow, Vt., has been engaged as designer at the Beaver Brook Mill, American Woolen Co., Collinsville, Mass.

Joseph Shaughnessey, overseer of finishing at the Hoosac Worsted Mill, No. Adams, Mass., has resigned to accept a similar position with the Marston Worsted Co., Skowhegan, Me.

Albert Sykes, overseer of finishing at the Marston Worsted Co., Skowhegan, Me., has severed his connection with that company.

Harry Dracup has accepted the position as overseer of the worsted carding and combing department at the Saxonville Mill, Saxonville, Mass.

J. T. Peden, master mechanic and chief engineer at the Hillsboro Cotton Mills, Hillsboro, Tex., has resigned.

R. F. Jennings has accepted a position as overseer of carding at the Cannon Mills, Kannapolis, N. C. He comes from Columbia, S. C.

A. R. Bennett, overseer of spinning at the Franklin Mills, Greers, S. C., has resigned to accept a position at the Brandon Mills, Greenville, S. C.

Robert Clark, overseer of weaving at the Saxe-Gotha Mills, Lexington, S. C., has resigned to accept a position at the Pelzer Mfg. Company, Pelzer, S. C.

C. T. Faulkner has been appointed superintendent of the Hutchison Mfg. Company, Banning, Ga.

R. W. Gibson, overseer of spinning at the Hartsville Cotton Mills, Hartsville, S. C., has resigned.

W. A. Skidmore, formerly overseer of spinning at the Shelby Cotton Mills, Shelby, N. C., has accepted a similar position with the Vass Cotton Mills, Vass, N. C.

E. C. Gossett, overseer of weaving at the Williamston Mills, Williamston, S. C., has resigned.

W. H. Hale, overseer of weaving at the Walton Cotton Mills, Monroe, Ga., has resigned to accept a position at New Holland, Ga.

C. F. James, assistant superintendent at the Marlboro Mill, McColl, S. C., has severed his connection with that company.

William Miller has been promoted from overseer of carding to the position of superintendent of Mill No. 3 of the Marlboro Cotton Mill, McColl, S. C.

Leonard H. Mellor, overseer of mule spinning at the Hathaway Mfg. Co., New Bedford, Mass., has resigned to accept a position as overseer of spinning and warping at the Booth Mill, same city.

W. H. Buckley has been appointed superintendent of the Baltic Mills Co., Baltic, Conn. Until recently Mr. Buckley was superintendent of the York Mill of the Cornwall and York Cotton Mills Co., St. John, N. B.

Spaulding Bartlett, for twenty years superintendent of the South Village Mill of S. Slater & Sons, Inc., Webster, Mass., has severed his connection with this company. H. E. Kirk of the Beaver Brook Mills, Lowell, Mass., has assumed charge of the mill as superintendent. With the change in superintendents, William E. Stewart, now superintendent of the East and North Village Mills, becomes agent of all three, and acting superintendent of the East and North Village Mills of the corporation.

Fred M. Howard, overseer of the No. 2 weave room at the Lockwood Mills, Waterville, Me., has resigned. He was the recipient of a purse of money from the workers in his room. Mr. Howard has been employed in the mill for 29 years, and since 1890 has been at the head of the weave room in No. 2 mill. He will be succeeded by Melville L. Stone, who has been second hand in the room.

Benjamin Jones, who has been overseer of the winding department at the American Thread Co., Willimantic, Conn., for a great many years, has retired from active work, but will be connected with the company in an advisory capacity. Thomas J. Little, who for many years has been his assistant, has been promoted to the position made vacant by the resignation of Mr. Jones.

James Thomson has been appointed agent and general manager of the Harmony Mills, Cohoes, N. Y., succeeding George F. Payne.

Robert L. Dawson has been appointed superintendent of the Millers River Mfg. Co., Athol, Mass., succeeding O. M. Sweet. Mr. Dawson was formerly superintendent of the Buell Mfg. Co., St. Joseph, Mo.

Richard Mayer, treasurer of the Troy Waste Mfg. Co., Cohoes, N. Y., has resigned.

John J. Murphy has succeeded Patrick Silk as boss finisher at the Darling Woolen Co., Hollliston, Mass. Mr. Murphy also has charge of the dyeing.

Arne D. Girard, overseer of knitting at the Otis Co., Ware, Mass., has severed his connection with that company and with his family expects to move to Chicopee Falls, Mass.

J. S. Zimmer, for twelve years superintendent of the glove department of the Bailey Mills, Fort Plain, N. Y., has resigned.

J. McLaughlin has accepted a position in charge of cutting at the Shawinigan Knitting Co., Shawinigan Falls, P. Q., Can.

William MacDonald, for the past five years superintendent of the Bath Knitting Mills, Bath, N. Y., has severed his connection with that company.

John Hinds has been appointed superintendent of the Columbus Mfg. Company, Columbus, Ga. He comes from the Tucapau Mills, Tucapau, S. C.

L. A. Gilbert has accepted the position as overseer of carding at the Griswoldville Mfg. Co., Griswoldville, Mass. He comes from Woonsocket, R. I.

Max Erlbeck, overseer of weaving at the No. 2 Acushnet Mill, New Bedford, Mass., has resigned. He had been employed for that company for eight years, having been overseer the past six years. The weavers in his employ presented him with a handsome purse of money in token of their regard, and he was also presented with a purse of money by the overseers employed for the company.

George Ward has accepted the position in charge of the finishing department at the Shawinigan Knitting Co., Shawinigan Falls, P. Q., Can. He comes from Galt, Ont.

R. A. Hagarty, superintendent of the Dunham Hosiery Co., Poquonock, Conn., has been appointed agent of the mill to succeed A. H. Brothers, who has resigned on account of ill health.

R. S. McCurdy of the Grand Rapids Knitting Works, Grand Rapids, Mich., has been appointed membership in the Board of Kalamazoo College.

Andrew Hackett has been appointed overseer of spinning at the Davis & Brown Woolen Co., Mill No. 2, Killingly, Conn. He comes from Dayville, Conn.

William J. Cole has accepted the position of master mechanic at the Manchaug Co., Manchaug, Mass. He succeeds F. C. Bigelow.

Frederick C. Hall has been appointed superintendent of the New Bedford Spinning Mill, New Bedford, Mass. He comes from the Kilburn Mill, New Bedford.

Walter Pettingill has been appointed master mechanic at the Hockanum Mills Co., Rockville, Conn., succeeding Charles L. Ware.

Thomas T. Somerville has accepted the position as overseer of finishing at the Hillsboro Woolen Mills, Hillsboro, N. H.

R. W. Gibson has accepted the position as overseer of spinning at the Fairfield Mills, Winnsboro, S. C. He comes from the Hartsville Mills, Hartsville, S. C.

J. P. Couch has accepted the position as overseer of weaving at the Middleburg Mills, Batesburg, S. C., having resigned a similar position with the Covington Mills, Covington, Ga.

Leland Dexter has accepted a position as overseer of spinning at the New England Cotton Yarn Co., New Bedford, Mass., succeeding Thomas Gilmore.

George Crowther has succeeded Thomas Connor as overseer of twisting at the New England Cotton Yarn Co., New Bedford, Mass.

Joseph Pepper, overseer of finishing at the Thayer Woolen Co., North Oxford, Mass., has resigned.

Edward McDermott has accepted the position as overseer of finishing for John and James Dobson, Bradford Mills, Germantown, Philadelphia. He comes from the Edward T. Steel & Co.'s mill, Bristol, Pa.

John N. Winslow has accepted the position as overseer of weaving at the Jefferson Mfg. Co., Jefferson, Mass. He comes from Danielson, Conn.

Fred F. King has accepted the position as overseer of carding at the Lockwood Co. No. 2 Mill, Waterville, Me. He was formerly carder at the B. B. & R. Knight's mill, White Rock, R. I.

Richard A. Boerner has accepted the position as superintendent of the Lymansville Co., Providence, R. I. He was formerly employed at the Bradford Mill, Germantown, Pa.

Hyland Jacwith, overseer of carding at the Nourse Mill, Manville Co., Woonsocket, R. I., has severed his connection with that company. He is to take charge of a new mill of the Orswell Co., Fitchburg, Mass., when it is completed.

Arthur Benson has been appointed assistant superintendent for D. Goff & Sons, Pawtucket, R. I. He comes from Wickford, R. I.

Robert Russell, overseer of dressing and warping at the Whittenton Mfg. Co., Taunton, Mass., has severed his connection with that company.

R. A. Connors has accepted the position as boss fuller and scourer at the J. C. Parker Co., Quechee, Vt. He comes from Ashuelot, N. H.

Isaac M. Hibbs, overseer of mule spinning at the Tabor Mill, New Bedford, Mass., has resigned to accept a similar position in the Hathaway Mills, Nos. 1 and 2, same city. He is succeeded at the Taber Mill by Fred Johnson, formerly second hand at this mill.

Mr. Muhlberger, superintendent of the Tamarack Co., Pawtucket, R. I., has resigned and is succeeded by Mr. Dean.

James Harwood has accepted the position as overseer of weaving at the Paul Whitin Mfg. Co., Northbridge, Mass. He comes from the Slater Mills, Pawtucket, R. I., but was formerly of New Bedford, Mass., where he was for many years overseer of weaving at the Wamsutta Mills.

Arnold Taylor, for the past fourteen years overser of the spinning, spooling and warping departments of Whitman Mill No. 1, New Bedford, Mass., has resigned. He was presented with a diamond ring by the help in these departments as a token of their esteem and respect for him.

William R. Vera, overseer of the comber needling department at the Bennett Mill of the New England Cotton Yarn Co., New Bedford, Mass., has resigned.

Frank E. Heymer, superintendent of the Manetta Mills, Lando, S. C., has resigned.

William H. Dyer has accepted a position as overseer of spinning at the Warren Cotton Mill, West Warren, Mass. He was formerly employed at the Boston Mfg. Company, Waltham, Mass.

James J. Barnes, overseer of weaving at the Stevens Mfg. Co., Fall River, Mass., has resigned to accept a similar position with the No. 2 Acushnet Mill, New Bedford, Mass.

Horace St. Marie has been appointed overseer of spinning at the Kilburn Mill, New Bedford, Mass., succeeding Lewis Cuddy. Mr. St. Marie started in at the Wamsutta Mill twenty-five years ago and has always been employed in the spinning department. He served as second hand in the following mills: Dartmouth, Acushnet and Howland Mills.

John M. Krestle has been appointed assistant superintendent of the machine shop connected with Cheney Bros. Co., Manchester, Conn. Jno. A. Hood has been appointed foreman of the carpenter, painting, piping and plumbing department at the Cheney Bros. Mill, at Manchester.

M. F. Steere, overseer of weaving at the Narrow Fabric Co., Westerly, R. I., has severed his connection with that company.

William F. Rawley has been appointed superintendent and designer of the Dumbarton Woolen Co., Dexter, Me. He comes from Sangerville, Me.

Richard Cowell, overseer of weaving at the Pierce Mfg. Co., New Bedford, Mass., has resigned to become superintendent of the Charlton Mill, Fall River, Mass.

Charles Blanchard has accepted the position as night overseer of spinning at the Burlington Mill, Winooski, Vt.

T. F. Sheehan has been appointed overseer of the cloth department at the Clinton Mill, Woonsocket, R. I

C. E. Foster, who has been assistant superintendent of the Champlain Silk Mill, Whitehall, N. Y., has resigned to accept a position with Cheney Bros., South Manchester, Conn.

W. H. Pettytt, overseer of dyeing at the Saxonville Mill, Saxonville, Mass., has accepted a similar position with the Orr Worsted Mill, Piqua, O. He is succeeded by Fred Lorimer, who has been doing the yarn dyeing for this same mill.

J. J. McFarland has accepted a position at the National Woolen Co., Cleveland, O. He was formerly employed for J. Broadbent & Son, Unionville, Conn.

John Eccles has retired as agent of the Ponemah Mills of Taftville, Conn., after thirty years' connection with the company, and on the occasion of his retirement he was presented with a splendid loving cup from the overseers and second hands. Mr. Rickerson of Pawtucket succeeds him as agent, and Mr. Aiken of Taftville, formerly assistant superintendent, is now the superintendent. Mr. Eccles carries with him on his retirement from the cotton business, after a lifelong service, the best wishes of a host of friends in the trade that he has made during his long and successful business career.

George W. Bean, for twenty-five years agent of the Androscoggin Mills, Lewiston, Me., has resigned on account of ill health.

Walter Lunt has been promoted to the position of overseer of finishing at the Campbell Woolen Mill, Sangerville, Me.

Henry C. Templeton, overseer of finishing at the Bay State Mills, Lowell, Mass., has accepted a similar position at the Atlantic Mills, Stottville, N. Y.

C. B. Maxfield, overseer of finishing at the A. H. & C. B. Alling Co., Derby, Conn., has severed his connection with that company.

Raymond S. Bartlett has been appointed assistant agent and superintendent of the Burlington Mill, American Woolen Co., Winooski, Vt. He comes from Franklin, Mass.

George F. Payne, general superintendent of the Harmony Mills, Cohoes, N. Y., has severed his connection with that company.

James W. Ferguson, for the past fifteen years in the employ of Robert Beatty & Co.'s mill of Philadelphia, Pa., has resigned to accept another position with the J. Frederick Houston Mfg. Co., Cumberland, N. C.

T. P. Talpey, widely known in the dye trade and by textile manufacturers, has been appointed eastern salesman for the Vacuum Dyeing Machine Co. of Chattanooga, Tenn. Mr. Talpey's headquarters will be at Passaic, N. J., and he will have entire charge of the eastern territory. He is a practical dyer and bleacher and for several years past has traveled on the road for a large dyestuffs and chemical house. T. Frusher, who formerly had the eastern agency for the Vacuum machine, is no longer connected with the Vacuum Dyeing Machine Co.

James H. O'Neil has taken up the position as assistant superintendent of the Sagamore Mill, Fall River, Mass., he having resigned the position as overseer of the cloth room at the Border City Mill, same city.

Thomas Connors, overseer of twisting at the Bennett No. 2 Mill, New Bedford, Mass., has resigned to accept a similar position at the Neild Mill, same city.

Joseph P. Davidson has accepted the position as overseer of finishing at the Franklin Mill, Franklin, N. H. He comes from Guilford, Me.

Samuel Jones has accepted the position as overseer of woolen twisting and spooling at the Globe Woolen Co., Utica, N. Y. He comes from West Eaton, N. Y.

Harold Penny has been appointed superintendent of the Phoenix Woolen Co., Stafford, Conn., succeeding his brother, Claude Penny.

Robert F. Herrick, who has been president of the Lowell Machine Shop and the Kitson Machine Shop, has assumed the position of treasurer of both companies, thus filling the vacancy caused by the death of the late H. C. Perham.

Samuel L. Dean has been appointed superintendent of the Jenckes Spinning Co., Pawtucket, R. I. Mr. Dean was formerly overseer of weaving at the Nashawena Mills, New Bedford, Mass.

John Curran, for the past three years an overseer in the Globe Yarn Mill No. 2, Fall River, Mass., has resigned. He was presented with a gold watch by his former employes.

P. M. Green, for the past two years assistant superintendent at the Rhode Island Worsted Co., Stafford Springs, Conn., has severed his connection with that company. At the conclusion of his services with the company, the office force, foremen and superintendent presented him with a silver smoking set and meerschaum pipe.

R. E. Thompson, for 12 years employed at the Nashua Mfg. Company, Nashua, N. H., has accepted a more lucrative position as that of assistant overseer to Mr. Wildes of the Hamilton Corporation, Lowell, Mass.

J. Haggerty, superintendent of the Union Mills, Herkimer, N. Y., has resigned. His successor is Philip Johnson of Hudson, N. Y.

J. A. Statum, superintendent of the Pioneer Cotton Mills, Guthrie, Okla., has resigned to accept a position with the Warioto Cotton Mills, Nashville, Tenn.

Matthew Allston has accepted the position as overseer of the finishing department at the Union Mills, Herkimer, N. Y. He comes from Waterford, N. Y.

Frank Lees, representing Bosson & Lane, has sailed for England, to be gone for several weeks.

Donald Lemieux, formerly connected with the Scotia Worsted Co., Woonsocket, R. I., has been appointed head designer at the National & Providence Worsted Mills, American Woolen Co., Providence, R. I.

Charles B. Musgrave, overseer of dyeing for Charles Porter & Sons, Philadelphia, Pa., has resigned on account of poor health. His successor is Alex. Cullen.

T. W. Brown, overseer of carding at the Newmarket Mfg. Co., Newmarket, N. H., has resigned and is succeeded by Mr. Walls of Lowell, Mass.

Lloyd R. Crandall has succeeded Curtis F. Randolph as secretary-treasurer of the Ashaway Line & Twine Mfg. Co., Ashaway, R. I.

Simon F. Lynch, overseer at Depts. 9 and 10, New England Cotton Yarn Co., New Bedford, Mass., has resigned.

W. B. Hazlewood has succeeded C. W. Pierce as Southern agent for the Universal Winding Co., and will make his headquarters in Charlotte, N. C.

J. H. Means Beaty, general manager of the Parker Mills, Columbus, S. C., has resigned on account of ill health.

G. R. Matthews, overseer of weaving at the Arcade Mills, Rock Hill, S. C., has resigned to become overseer of weaving, finishing and dyeing at the Cowikee Mills, Eufaula, Ala.

T. C. Wilson, until recently superintendent of the Osage Mill, Bessemer City, N. C., has been appointed superintendent of the Wadesboro Cotton Mill, Wadesboro, N. C.

W. F. Rawl, overseer of weaving at the Middleburg Mills, Batesburg, S. C., has resigned to accept a similar position with the Palmetta Mills, Columbia, S. C.

D. B. Whaley, overseer of carding at the Muscogee Mfg. Co., Columbus, Ga., has resigned.

A. C. Medlin, formerly overseer of spinning at the Louise Mills, Charlotte, N. C., has accepted a position as overseer of carding and spinning at the Lumberton Cotton Mills, Lumberton, N. C.

W. P. Foster has accepted the position as overseer of carding at the York Cotton Mill, Yorkville, S. C. He comes from Cliffside, N. C.

J. F. Welch has accepted the position as overseer of spinning at the Glencoe Mills, Burlington, N. C.

E. C. Greer, superintendent of the Batesville Mills, Batesville, S. C., has resigned.

J. W. White, formerly of the Verlina Mills, Jacksonville, Ala., has accepted the position as overseer of weaving at LaFayette, Ga.

George Bidwell, formerly overseer of finishing at the River Spinning Co., Woonsocket, R. I., has accepted the position as finisher at the French River Textile Co., Mechanicsville, Conn.

James L. Smith, for the past fifteen years in charge of the boarding, finishing and packing departments at G. H. Tilton & Sons, Laconia, N. H., has resigned.

William Hesseldent, overseer of weaving at the Oakland Mfg. Co., Reisertown, Md., has severed his connection with that company to accept a position at the Esmond Mill, Esmond, R. I.

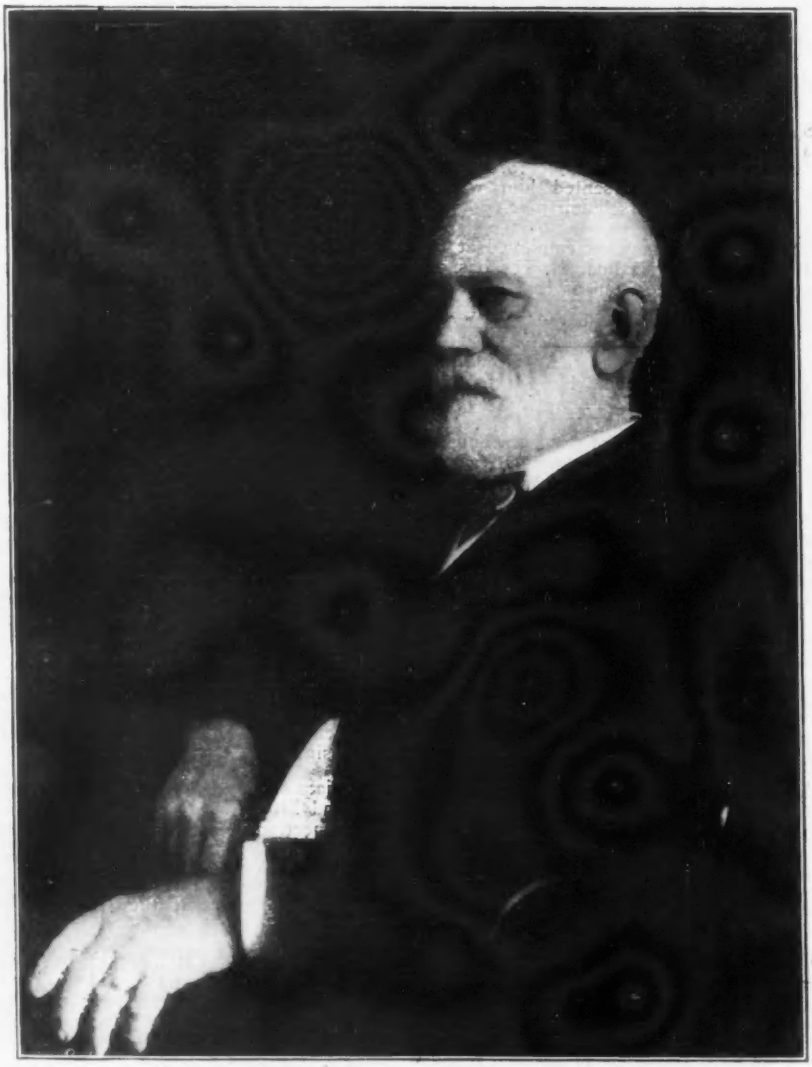
Fred Greenwood has accepted the position as overseer of dyeing at the U. S. Finishing Co., Apponaug, R. I.

Clovis Heanult has accepted the position as overseer of dyeing at the Sidney Blumenthal & Co.'s mill, Shelton, Conn. He comes from the worsted department of the Orr Felt & Blanket Co., Piqua, Ohio.

Joseph F. Miller has accepted the position as overseer of carding at the Oak Valley Mills, Tarkiln, R. I. He comes from Dexter, Me.

Charles L. Perry, for the past two years superintendent and assistant agent at the Burlington Mills of the American Woolen Company, and for eight years previously superintendent of the Assabet Mills, has severed his connections with the company.

The death of Thomas Walsh on June 26th, removed one of the old school of mill managers and a prominent citizen and long time resident of Lowell. For 37 years Mr. Walsh was connected with the Hamilton Print Works. In 1876 he was appointed superintendent, and held that position until his voluntary retirement on account of failing health in 1907. He was one of the best known calico printers in this country.



THOMAS WALSH.

Mr. Walsh was born in 1831 in Darwen, Lancashire, England. Early in life his parents moved to Tottington, near Bury, where he received his education and learned the business of calico printing at the Tottington Mills, owned by Samuel Knowles. At the age of 22 he came to this country and accepted a position at the the Lodi Print Works, Lodi, N. J. The climate did not agree with him, so he moved to Lawrence, having secured employment as machine printer at the Pacific Print Works. Shortly after this, he married the daughter of Lawrence Pollard. Mr. Walsh's particular specialty at this time was the printing of delaines. For one year he was connected with the Dunnell Print Works at Pawtucket, R. I. Returning, how-

ever, to the Pacific about this time, he invented a machine for printing yarn, the rights of which were purchased by John Forrest, who further developed it at his works at Philadelphia. A short time during the year 1867, he was at the Manchester Print Works, Manchester, N. H., and at the Richmond Print Works, Providence, R. I.

Like many mill men who some time in their career are attracted to the farm, Mr. Walsh went through this experience and bought a ranch in California. It did not take him long to realize that he was not cut out for a farmer, so he returned East, to Pawtucket, R. I., making the trip over the Union Pacific R. R. within a few weeks of the opening of transcontinental traffic. Later he obtained a position at the Hamilton Print Works as overseer of the print room. This was in 1870, and six years later he assumed the superintendency of the works, which he held for more than 30 years. Under his efficient management the Hamilton Print Works was not only a financial success, but Hamilton prints received a high and deserved reputation. It was often said in the trade that when the Hamilton Print Works closed or were running on short time, business must be very bad, but this happened very seldom in his long connection with the company.

Mr. Walsh had a special aptitude for his chosen business. He was constantly making improvements in cloth printing machinery and devising better ways of doing the work. He invented a number of new processes for producing special styles. Many of these were real discoveries and most ingenious and resulted in the sale of millions of yards of cloth from these patterns. Although many of his improvements and special processes might easliy have been patented by him for his own benefit, they were always employed for the benefit of the company, in whose success he was as much interested as if it were his own.

As a citizen, Mr. Walsh served 20 years as trustee of the city library. He was one of the original trustees. Remembering his own early efforts to acquire knowledge, especially technical knowledge, he was particularly interested that the library should contain such industrial and scientific works that would be of benefit to the mill population of Lowell. He was active in the foundation of the Lowell Textile School and always served as one of its trustees, the department of dyeing and chemistry being under his special care. Mr. Walsh was a man of strong opinions, and no one was ever in doubt as to his attitude on any matter in which he took an interest. Quiet and unostentatious, yet he was a good speaker when occasion demanded. He was active in Masonic affairs, being a member of the Ancient York lodge, Mt. Horeb Royal Arch Chapter and Pilgrim commandery, having been Eminent Commander of the latter body. He is survived by his widow, a daughter and a son, Col. Frederick T. Walsh, of West Newton, Manager of the firm of Thomas Leyland & Co., of Boston.

Jacob Weidmann, an expert silk dyer and a resident of Paterson, N. J., died at his home on Park Ave. of apoplexy, which he had been suffering with for the past few weeks. He was considered one of the most expert silk dyers in the country, and is survived by a widow and one daughter.

James J. Brainerd, founder of the Brainerd & Armstrong Silk Company, of New London, Conn., died at the home of his daughter in Cambridge, Mass., at the age of 85 years. He was born in Middle Haddam, Conn., and at an early age, after being educated in the public schools, he went to New London and started the silk business. He is survived by a daughter and one son.

Joseph C. Whitney, a retired wool commission merchant, died recently at his home in Milton, Mass., at the age of 54 years. He had for a number of years devoted his attention to the management of estates in Boston. He retired from the wool business in 1886.

Francis Whitehead, for nearly thirty years overseer of the spinning department at the Sawyer Woolen Mills, Dover, N. H., and one of Dover's oldest and most highly esteemed citizens, died July 20 at his home, 58 Central Ave., at the age of 81 years. One son and a daughter survive him.

E. W. Cook, a well known overseer of finishing on woolen and worsted goods, died at Maynard, Mass., after a short illness, at the age of 50 years. He had been employed for several years at the Weybosset Mills, Providence, R. I., for several years at the Assabet Mills, Maynard, Mass., and the Stott Woolen Co., Stottville, N. Y. He was well liked by all who knew him.

Thomas J. Rigney died at his home, 4 Park St., Webster, Mass., July 2nd. Mr. Rigney was one of the best known finishers of woolen and worsted goods in this country, having been employed in some of the leading mills, including the Harris Woolen Co., Woonsocket, R. I., the Cocheco Woolen Mfg. Co., East Rochester, N. H., Auburn Woolen Co., Auburn, N. Y., Beaver Brook Mills, Collinsville, Mass., and the Bound Brook Woolen Co., Bound Brook, N. J. Mr. Rigney was to take up his duties as overseer of finishing at the Atlantic Mill, Stottville, N. Y., on July 5th, having engaged with that concern a few days previous to his death. While in Worcester on July 1st on personal matters, he hurried to catch the electric car for his home and was taken with severe pains in the chest. Thinking they would pass away he thought nothing of it until Sunday morning when he complained of dizziness. Mrs. Rigney started to bathe his forehead and as she was doing so he expired in a few minutes. He was 58 years of age and leaves a widow and three daughters. The funeral was held at Webster, Wednesday morning and his remains taken to Rockville for interment. Mr. Rigney was a home man and very devoted to his family. The beautiful floral offerings showed the esteem in which he was held.

James B. Loflin, superintendent of the Lydia Cotton Mills, Clinton, S. C., died recently in Kenosha, Wis. Mr. Loflin was considered one of the most able superintendents in the South, having held important positions with the best mills in South Carolina. He is survived by his wife.

Benjamin F. Almy, for many years a dealer in cotton waste, died at his home in Johnston, R. I., at the age of 77 years.

NEW PUBLICATIONS

The Official American Textile Directory for 1911-12; compiled by the Textile World Record; 700 pages; 23 textile maps; Lord & Nagle Company, Boston, New York and Philadelphia, publishers; Office Edition, $3.00; Travelers' Edition, $2.00.

The new directory maintains the standard set by previous editions and in many ways is an improvement over any directory of the textile trade previously compiled. The past year has been a period of great changes. Scores of mills have gone out of business, or have been taken over by new companies and between three and four hundred new plants have been started. In addition there have been thousands of changes in mill officers, mill equipment and in the products of old-established mills. These are all accurately given in the mill section of the directory.

Great strides have been made in compiling trade directories and the lead in the textile field at least was taken by the Textile World Record publications. Their development of textile map features, classified indexes and simple, self-indexing arrangements, features designed to save time and increase the usefulness of directories, mark some of the steps taken. Finally the canvassing of the whole industry by representatives and by mail, a few weeks before the publication of the directory, verifying and amplifying reports, which had come in from time to time, was worked out, bringing the information close to the date of publication and insuring the highest degree of accuracy. To do this successfully extended reporting and news-gathering facilities are necessary. The publishers, being also the publishers of the Textile World Record, have the services of an extensive organization in this work, which cannot be equalled by smaller publishers of books of this character.

Some of the special features of the Official Directory are as follows: A complete directory of textile mills of all classes, with full information, such as name of company or firm, names of officers, character of goods made and machinery equipment.

Copyrighted maps, by which any town referred to in the text can be quickly located on the map. There are twenty-three of these textile maps, which show only the cities and towns where there are textile establishments and junction points. Railroad facilities, distance from other towns, etc., are shown.

A yarn trade index, which gives a classified list of manufacturers of different kinds of yarn who spin for the market; size of yarns spun and the way it is put up are given

A classified list of cloth manufacturers, giving the classes of goods manufactured in every mill.

A commission and order section, giving classified lists of establishments doing all sorts of dyeing, bleaching, finishing, mercerizing, etc., on order for manufacturers and converters.

A list of mills with worsted machinery for the convenience of those dealing exclusively with that branch.

In this edition indexes have been printed on different colored paper from the mill reports, enabling quicker reference to the section desired. The running headings at the top of pages have been made to show at a glance the contents of each page.

Other features are an alphabetical index, dealers in raw materials, lists of manufacturers of and dealers in cotton and woolen waste, shoddy and flocks, selling agents and dry goods commission houses, mgachinery and supply section, and a list of the textile associations in the United States and Canada, with officers, addresses, etc.

In preparing the directory simplicity of arrangement has constantly been aimed at. Information, when wanted, is wanted immmediately, and with anything but the most simple arrangement in a book of the extent of a complete textile directory, much time is wasted looking for information. This fact is not always given the attention it deserves from publishers.

Turkey Red and its Competitors (Turkischrot und seine Konkurrenten) by Dr. F. Felsen; 125 pages, 8 1/2 by 11; Verlag fuer Textil-Industrie, Berlin. Price $5.

Beginning with a brief history of the uses of madder, this work is divided into chapters dealing with the following subjects:

2. Alizarine.
3. Other methods of read dyeing with basic and acid dyes.
4. Substantative dyestuffs.
5. Colors developed on the fiber.
6. Vat dyes.
7. Rose alizarine colors.

In addition to the text the work contains numerous dyed samples showing raw goods and the effects of numerous tests on the colors, such as washing, bleaching and exposure to the weather and light. The text is in German.

Cotton Futures, by Alfred B. Shepperson, New York; 66 pages, 4 by 7.

This booklet begins with an account of cotton futures written by Mr. Shepperson and in which he explains the legitimate trade value of dealing in futures as distinguished from the speculative value. Then follow a large number of letters from cotton merchants and Southern banks giving facts regarding the necessity of maintaining a futures market. The book is of interest in connection with the agitation to abolish trading in futures.

BUSINESS LITERATURE

Single Stage, Single Suction Centrifugal Pumps; The Goulds Manufacturing Co., Seneca Falls, N. Y.

Bulletin 105 contains much useful information regarding the new Goulds single stage, single suction centrifugal pump. It describes and illustrates its construction and adaptibility for various uses.

Power Water Cooler; Power Specialty Co., 111 Broadway, New York.

Bulletin No. 201 describes the power water cooler which this company is introducing into the

United States. The field of usefulness is an extensive one, varying from the cooling of air for residences to refrigeration of air for blast furnaces. It is also largely used for cooling circulating water of gas engines, and for cooling water and other liquids for various purposes. As a humidifier and dehumidifier it is also stated to be remarkably successful.

More Light; The United States Gutta Percha Paint Co., Providence, R. I.

A booklet showing how a manufacturer who uses Rice's mill white paints effects a saving from the first day it goes on his ceilings and walls. It also gives a list of the different mills in the country whose ceilings and walls are covered with this new light-giving paint.

Fall River and its Manufactures, 1803 to 1910; G. M. Haffards & Co., bankers, Fall River, Mass.

This booklet of 71 pages contains much interesting and useful information regarding the development and present conditions of the cotton industry in Fall River.

Remek Transformers; The Crocker-Wheeler Co., Ampere, N. J.

A 5-page folder based on a thorough analysis of the underlying principle of transformer design. It will be of special interest to users of transformers as it explains in a few words the exact causes of the loss of energy in transformers.

The Utilization of Waste Steam. Benj. F. Kelley & Son, 25 Church St., New York.

This booklet describes how waste steam can be profitably utilized through the use of the standard water tube feed water heater and the Kelley grease extractor and oil separatos. Some mills have hesitated about using exhaust steam in the dye house because of the danger of oil, but this oil extractor overcomes this difficulty.

Ad-Hints, A Little Booklet of Advertising Inspiration.

The Holophane Co., Newark, O. A pamphlet recently issued by the Holophane Co., for distribution among central stations and contractors to be used as sugestions for their local newspaper advertising.

The book contains ten electric lighting advertisements, with appropriate cuts, and is prefaced by a number of short, pithy ad-hints, such as:

"If you want to know how bad your company's advertisements are, read two or three of them aloud to your "best girl," or the chauffeur, or a foreigner, or try to explain them to the baby. However, do not try this experiment unless you are feeling very, very strong."

The ads, which were prepared by the Rae Company, each deal with the lighting of some part of the home, from the front porch to the garage or barn, and are arranged for either single or double column display.

COLOR CARDS

Dyeings Fast to Washing on Knitting Yarn. The Cassella Color Co., New York.

A series of 12 dyeings on knitting yarn possessing extreme fastness to washing, showing popular ranges from yellow to olive browns, navy blues and blacks. The dyestuffs shown are well adapted for coloring wool in dyeing machines. Copies can be obtained upon request at any of the branches of the Cassella Color Co.

Cotton and Artificial Silk. The Cassella Color Co., New York.

This color card shows a series of 36 dyeings on fabrics composed of cotton and artificial silk. The use of artificial silk involves a different problem from natural silk. These samples show dyes that possess the property of coloring these two widely differing fibers the same shade in the same bath; the folder contains practical working details and may be obtained by dyers on application before the edition is exhausted.

DISSOLUTION OF PARTNERSHIP

The partnership heretofore existing under the name of Szepesi & Farr, has been dissolved, and the affairs of the firm will be adjusted and the business continued by Eugene Szepesi at 14 Milk Street, Boston.

THE PRICE-CAMPBELL COTTON PICKER

William S. Bullock, formerly with the Textile Manufacturers' Journal, has accepted a position with the Price-Campbell Cotton Picker Corporation, with his office at 24 South William St., New York. Mr. Campbell will be pleased to give information regarding this machine and to show it in actual operation to visitors at his New York office.

BALL-BEARING NAPPERS.

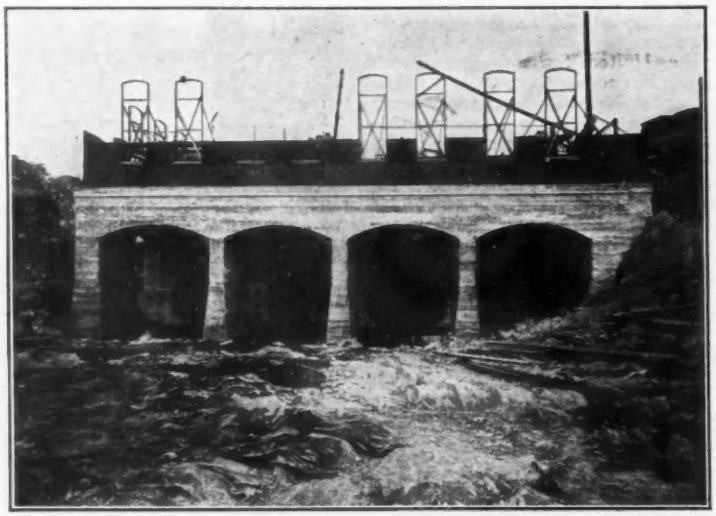
One of the improvements in napping machines which has been quite generally adopted by the best makers, has been the use of ball bearings on the napping rollers. We beleive that the Monfort machine, of which L. H. A. Schwartz & Co., 53 State St., Boston, Mass., is the American agent, was the first to use ball bearings on napping rollers, and that is one of the many features which have commended it to the use of mill men on account of its easy and smooth running. The American agents of this napper have within a few days received a repeat order from a large cotton blanket mill in New England for 12 of these napping machines. This mill previously had 9 Montfort nappers in use and with this new order they will have 21 machines of this type.

North Carolina, Albemarle. Contract has been awarded to T. C. Thompson & Bros. of Charlotte and Birmingham, for the erection of a 2-story brick mill construction building as an addition to the picker department of the Wiscasset Mills Co.

CONCRETE IN A NEW HYDRO-ELECTRIC STATION

One of the most recently completed hydro-electric power stations is that supplying current to the Otis Co.'s Palmer Mills near Three Rivers, Mass. This development is located on the Chicopee River, about 1,000 feet below the mills, and Lockwood, Greene & Co., of Boston, were the consulting engineers. With the exception of a superstructure of brick, concrete was used throughout and it almost seems as if this was becoming standard practice.

The dam, which is of concrete masonry, stretches diagonally across the river and one end sets in a ledge on the north shore of the river, where the anchorage for the concrete is suitable, while at the other end is located the power house which is at right angles to the flow of the river. Wherever practicable, the dam is ballasted with



THE CONCRETE DAM AT PALMER MILLS.

THE TUBES IN THE CONCRETE FOUNDATIONS.

The wing walls, the abutments and the power

rubble, and the face, crest and back have a uniform granolithic surface finish.

The wing, walls, the abutments and the power house foundations and floors are also of concrete and of special interest in this connection are the forms used for the draft tubes.

These completed draft tubes are eliptical in shape with dimensions of 13 by 19 feet and the forms used were made up entirely of wood. The tubes are formed in the concrete foundations. They were designed to discharge the water from the wheels horizontally down-stream and at a very low velocity. Under average conditions the discharge water emerges below the surface of the down-stream storage pond at less than 2 1/2 feet per second.

DUST REMOVAL FROM CARD-ROOMS

The Textile Mercury, of England, in commenting upon the report of the Superintendent of Factory Inspection, has this to say about the question of dust removal from card-rooms. This reform is engaging the attention of manufacturers in this country as well.

During the past year the Divisional Superintendent of the N. W. Division and his staff have devoted considerable time to the question of dust in card-rooms. At the end of the year, the returns showed that 117 factories had been wholly or partially fitted with the necessary exhaust appliances, while in 102 other cases the apparatus was either on order or was being erected. Circulars were issued during the year by the Committee of the Masters' Federation and the Blackburn and Burnley Employers' organization, urging that such systems for dust removal should be adopted as had been found to be effective. The Report adds: "There is every reason to hope that before this time next year a large proportion of the mills in Lancashire will have been dealt with, and that one of the greatest sanitary reforms of recent years in connection with cotton mills will be well on the way towards completion."

SAVES FIVE OPERATIVES

When the automatic double head bobbin winder for winding filling on narrow fabric looms was first brought out by F. A. Lazenby & Co., of Baltimore, Md., the W. E. Hooper & Sons Co., of Baltimore, put in several of these machines. A short time ago the manufacturers received from this concern the following letter, showing that their claims for great labor saving are thoroughly borne out:

Baltimore, Md., June 30, 1911.

Messrs. F. A. Lazenby & Co., Baltimore, Md.

Gentlemen:—Enclosed herewith please find our order for ten additional automatic double head bobbin winders, which taken together with the previous orders already delivered, we believe will meet the requirements of our entire mill. We are particularly pleased with the results obtained up to date, and upon the installation of the additional order, we expect to do all our bobbin winding with one operative, whereas formerly six were constantly employed. If our recommendation can, at any time, be of service to you, you have our consent for the free use of our name.

Very truly yours,
W. E. Hooper & Sons Co.,
Wm. E. Hooper, Pres.

COTTON MILLS IN JAPAN.

By the courtesy of the Bombay office of Messrs. The Mitsui Bussan Kaisha, the Textile Recorder is able to give below the list of cotton mills at present working in Japan, with the number of spindles and looms:—

Name of Mills	Ring Spindles	Mule Spindles	Doubling	Looms
Osaka	134,532	....	7,752	4,612
Settsu	156,552	....	....	....
Oska Godoh	132,048	....	24,748	....
Fukushima	69,460	....	....	....
Nippon	76,480	8,280	34,820	....
Tenma	12,928	....	....	756
Naigai Wata	28,704	....	3,318	916
Ozu Hosoito	20,496	....	8,308	....
Sakai	23,808	....	1,200	200
Kishiwada	65,352	....	....	....
Wakayama	31,248	....	....	....
Wakayama	19,120	....	....	752
Nippon Seifu	12,672	15,600	....	500
Amagasaki	68,527	....	31,400	315
Harima	11,520	....	....	....
Shikama	7,420	....	....	....
Kenshi	70,056	....	....	1,028
Kurashiki	59,264	....	....	....
Gosho	6,912	....	532	....
Shimumara	4,564	....	....	....
Handa	4,992	....	....	....
Kaizuka	2,304	....	....	....
Matsuyama	10,368	....	....	....
Ehime	11,136	....	....	....
Sanuki	10,728	....	....	....
Meiji	16,128	....	....	....
Miye	241,668	1,000	7,760	4,272
Shimada	1,704	....	....	....
Watanabe	2,720	....	....	....
Kanegafuchi	297,684	....	27,940	1,805
Fujigasu	164,764	27,640	50,792	621
Nisshin	67,032	....	27,836	....
Tokio	81,030	....	12,719	250
Shimozake	28,400	1,598	....	....
Miyagi	228	2,000	....	....
Tokio Calico	11,136	....	....	442
Takaoka	10,920	....	....	....
Total	1,974,605	56,118	239,125	16,665

SOUTHERN AGENCY.

Alfred Suter, textile engineer, of 487 Broadway, New York, has made arrangements with A. L. Milliron, mnager of the Charlotte Mill Equipment Co., of Charlotte, N. C., for the sale of his yarn and cloth testing instruments in Virginia, North and South Carolina. This company has an extensive trade in that section, and manufacturers will find it convenient to avail themselves of the services of Mr. Milliron, and their inquiries concerning this line of apparatus may be sent to him direct.

NEW TWELVE-STORY OFFICE BUILDING FOR H. W. JOHNS-MANSVILLE CO.

The accompanying photograph shows the new twelve-story office building now being erected on the southwest corner of 41st street and Madison avenue, New York City, for the H. W. Johns-Manville Co., who will occupy it in its entirety about May 1st, 1912, as the general offices and New York salesrooms of the concern.

It was the desire of the owners to have a distinctive building, and the early Italian Gothic architecture was selected. This style of architectural treatment has not heretofore been employed for buildings of this character, and in this respect the edifice will be unique.

The details of the two facades are adapted from various Italian examples. The three lower stories are of limestone and the upper stories of gray-brown Roman brick and terra cotta, with various light-colored marbles worked in panels. Under the cornices are various colored marble panels in terra cotta frames.

Each floor will be devoted to one or more departments. The executive offices will occupy the eleventh floor, while the twelfth floor will be used as a sample and exhibition room.

The building has been designed so that all four sides will be attractive. It will be known as the "Johns-Manville Building" and will have the unique distinction of being one of the few twelve-story structures to be entirely occupied by a manufacturing concern for office purposes only.

The building will be of fire-proof steel construction throughout, and will contain two Otis passenger elevators of the latest type. Each floor will have an area of 2500 square feet, or a total area for the twelve floors and basement, which will extend under the sidewalk, of 34,500 square feet.

An unusual feature connected with this building will be the fact that the tenant manufactures and will furnish a considerable part of the equipment of the structure. Among the various materials which the H. W. Johns-Manville Co. will install will be the following: J-M Asbestos Roofing, J-M Asbestos Plaster, J-M Linolite System of Lighting, J-M Conduit for wiring, Flushometers, J-M Sanitor Seats, Electrical accessories, Waterproofing, Keystone Hair Insulator, J-M Asbestos Wood, Fire Extinguishers, J-M Asbesto-Sponge Felted and J-M Asbestocel Pipe Coverings, etc. Fire-proof materials will be used throughout the structure. Modern systems of heating and ventilating will be employed, and the building will rank, architecturally and otherwise, among the handsomest and most substantial office structures in New York

This is but one of a chain of branch stores, warehouses, offices, and factories scattered throughout the United States and Canada, which are under the supervision of the executive offices of the company, whose headquarters will be in this new building. Including the space to be afforded in the new general offices, the H. W. Johns-Manville Co., at the present time, occupies in all of its various branches, offices and factories, 2,657,160 square feet of floor space, or about 61 acres. The 5000 employes of the company would in themselves form a ood-sized little city. Included in this array of employes are 406 salesmen, travelling through various sections of this country and Canada. In addition, the company has extensive European offices at Hopetoun House, 5 Lloyd's avenue, London, E. C., and other representatives on the Continent of Europe.

The name of "H. W. Johns-Manville Co." and "Asbestos and Magnesia" have so long been synonymous, that many will be surprised to learn that this company also manufactures a very large line of electrical goods, plumbers' supplies, building materials, automobile supplies, cold storage insulation materials, railroad supplies, etc.

WILLIAM H. DOOLEY APPOINTED TO LOWELL INDUSTRIAL SCHOOL.

William H. Dooley, the prime mover in the establishment of the Lawrence Industrial School, has been appointed head of the new industrial school which has been established in Lowell along the lines of the Lawrence School. Mr. Dooley's successful experience in Lawrence renders him particularly competent to establish a similar undertaking in the sister city of Lowell.

*North Carolina, Thomasville. Work has been started on increasing the Amazon Cotton Mills from a 6,000-spindle plant to 12,000 spindles. The capital stock, which is $125,000, will not be changed, according to C. G. Hill, the secretary and treasurer. All contracts have been let.

VERSAILLES MILL SALE

The sale of the Versailles mills of the Uncasville Mfg. Co., handled by J. E. Conant Co., of Lowell, was successfully accomplished on July 27. While the attendance was not as large as at other recent mill sales conducted by this concern, there were enough bidders, and those present were there for business. The attendance covered bidders as far south as Tennessee and as far north as Canada.

The property was assessed for a little over $60,000, and brought nearly $64,000. The mill realty was purchased by Chas. A. Kittle, 611 West 127th St., New York, for $23,000. The village property sold in 23 lots, at an aggregate price of $14,830. Two wood lots sold for $3055. The machinery and personal property sold for $22,700.

The mill was equipped to make colored cotton goods, with 7000 spindles and 220 looms.

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THE ARABOL MFG. CO.

Arabol Gum G is one of the staples of the Arabol Mfg. Co., 100 William St., New York. When used in its pure state it gives excellent results in light or heavy sizing of cotton warps and is especially recommended for use on export goods, such as China shirtings, drills, denims, coarse or medium goods, etc. Mixed with starch it gives more volume and adhesive power, adding, at the same time, elasticity and tensile strength.

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THE MEETING OF THE SOUTHERN TEXTILE ASSOCIATION

The annual meeting of the Southern Textile Association held at Greenville, S. C., in July, was largely attended. Fully 350 mill men put in an appearance when the meeting was called to order by President H. J. Haynesworth of the Board of Trade, who gave a short address of welcome on behalf of the Board of Trade. Mr. Haynesworth then introduced Mayor John B. Marshall, who extended a welcome on behalf of the city of Greenville. Mr. W. L. Lowry of Monroe, N. C., responded to the address of welcome.

The following papers were read: "Opening and Cleaning Cotton," by J. E. Cheesman, of New York. "Efficiency of Operation and Waste Utilization," by Eugene Szepesi, of Boston. "The Construction of the Cotton Card," by Fred Taylor, Clemson College, S. C. "The Weave Room," by Z. H. Mangum, of Gibsonville, N. C. There was a short discussion of the papers, but this was limited on account of the length of the program. The afternoon session adjourned at 4.15 p. m., and a trolley ride was taken among the large mills of Greenville.

The evening session was called to order by President Hamrick and a very interesting paper was read on "Village Improvement," by J. F. Carbery, of Washington, D. C., a government expert. At the business session the following officers were elected: President, M. G. Stone; vice-presidents, J. M. Davis, T. B. Wallace, J. S. Osteen and E. E. Bowen. G. S. Escott was re-elected secretary and David Clark, treasurer.

After the business meeting a very interesting paper on "The Electrical Specialist in the Cotton Mill" was read by J. P. Judge, of Baltimore, Md. The convention then adjourned to enjoy the elaborate banquet that had been prepared for them.

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CONSULTING CHEMIST ESTABLISHES NEW OFFICE

J. Merritt Matthews, Ph. D., Consulting Chemist to the Textile Industries, announces that he has established an office and laboratory in the new Chemists' Building in New York City, where every facility and equipment is at hand to furnish his clients with the most efficient service.

He is prepared to undertake investigations and researches in all problems relating to the chemical processing of the textile fibers, such as bleaching, mercerizing, dyeing, finishing, examination of raw products and materials used in manufacture.

Yearly arrangements can be made with mills for a scientific supervision of their work and standardization of their processes along lines of greatest efficiency and economy.

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SOLUBLE SOFTENING OIL

The trouble with many softening oils is their inability to stand heat; they get easily sour in summer time.

In preparing their Soluble Softening Oil the Arabol Mfg. Co. of New York have aimed to overcome this difficulty and to secure a compound of absolute uniformity all the year round. It is easy to handle, neutral and therefore suitable to close woven and strong goods. It gives a smooth finish to the warps while the threads divide well in the lease rods and the cylinder of the slasher remains perfectly clean.

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FAREWELL BANQUET TO SAYLES OVERSEER.

A farewell bganquet was held in honor of Edward Mason, on Saturday, July 8th. Mr. Mason, who resigned a week before, has been offered a more lucrative position, and having had a wide experience in the bleaching and finishing business, he has no fears for the future.

Twenty-two of his former foremen, along with a few friends, sat down to a splendid repast at the Benedict House, Pawtucket. After supper, the toastmaster, Mr. L. Douther, called upon Mr. Harrison, who said he had a very pleasing duty to perform, and that was to present Mr. Edward Mason with a diamond ring and stickpin. Mr. Mason, he said, had made a lot of friends while in Pawtucket and Central Falls and they were very sorry to let him bgo from their midst.

Mr. Mason responded, saying that they had taken him wholly by surprise. For a few moments he could hardly speak. However, he said that while in Sayles' Bleacheries he had tried to do his best, also to please everyone, and thanked them very much for their kindness and good feel-

ing. He concluded by saying that if he had the same class of foremen to deal with in his new field of labor, he would never be behind the times, for they had stood by him in everything, and he thanked them all from the bottom of his heart, and wished them all prosperity in the future.

Mr. J. and Mr. T. Rubery furnished some good songs and duets, and Mr. Mayoh was the accompanist. After singing "For he's a jolly good fellow" and "Auld Lang Syne" the party broke up at 11.30, having fully enjoyed the evening.

MEETING OF THE SOUTHERN NEW ENGLAND TEXTILE CLUB.

The regular monthly meeting of this club was held on Saturday, July 15th, at the Pomham Club. About 180 members were present. After a real Rhode Island clam bake dinner the members scattered to the bowling alley and to the ball field to witness a contest between two evenly matched teams made up of the members. The party broke up about five o'clock, a large number returning to to Providence in an auto truck. This was a very successful meeting.

SCOTT & WILLIAMS WINS ANOTHER IMPORTANT SUIT OVER KNITTED FABRIC PATENT

Not many years ago, fabric patents, especially those covering knitted fabrics, were looked upon as of small value, largely because of many decisions which failed to sustain them. Consequently an impression prevailed in the minds of many knit goods manufacturers that a patented fabric could be made regardless of the patents involved, and they entertained the erroneous notion that the inventor must necessarily rely upon the patents covering the machine upon which the fabric was made. The experiences of Scott & Williams, Inc., in the courts in connection with litigation based upon fabric patents have worked a revolution in the attitude towards such fabric patents. In every case where they have sued not only have the claims been daclared valid, but the defendants have been adjudged infringers.

The last experience of this company was based upon the suit brought jointly by Scott & Williams, Inc., and one of their subsidiary concerns, the General Knit Fabric Company, against the Steber Machine Company and Bernard T. Steber of Utica, N. Y., for infringement of the product, process and machine patents covering the manufacture of the well-known and widely advertised Interlock Underwear, and the Court has declared that the Steber Company has infringed all the claims in suit, and all have been held valid.

The success of actions of this sort, when brought by Scott & Williams, Inc., is undoubtedly largely due to the fact that this concern adopts the wise course of going very thoroughly into the technical side of their cases, and long experience in such matters, coupled with a familiarity with all the details of the art, enables them to so present their proofs that, when in the hands of competent counsel, the chances are all in favor of the Courts sustaining their contention.

They have reduced such matters to a most comprehensive system and are enabled by reference to their very complete records to make exhaustive searches as to the prior art, and this, we take it, is responsible for their universal success and is widely at variance with the old rule-of-thumb methods.

Another interesting fact is that throughout the history of this company they have never been attacked and obliged to pose as defendants in patent litigation, so that it is a fair assumption that their system works both ways, that is to say, it enables them to know their ground so thoroughly that they keep out of trouble themselves and yet manage to win the cases when they are the complainants.

We are informed that they are about to commence other litigation in support of their many patents covering hosiery machines.

BOSTON HOLOPHANE OFFICE MOVES

The Boston office of the Holophane Company, in charge of Mr. H. C. Jones, moved into new quarters on the 26th of June. The new address is 10 High St., where both the office and stock room are now located.

FENCE POSTS THAT LAST

In the United States alone 3,000,000,000 ft. B. M. of posts are destroyed annually, and of this 90 per cent. on account of decay. These figures are compiled from Government statistics. This great loss, expressed in dollars and cents, runs into many millions, yet something like 50 to 60 per cent. could be saved by employing practical methods of timber preservation before setting the posts. As every mill owner is called upon to build and maintain fences, any information leading to a better understanding of the subject should be highly welcome. There is no doubt a general desire for better conditions and more economical methods of management, but only a limited number have as yet availed themselves of successful methods that will prolong the life of the posts.

The Carbolineum Wood Preserving Co., 197 Franklin St., New York, have recently issued a circular which covers the subject of fence-posts and methods for their preservation in a most thorough manner. It will be sent upon request and should be in the hands of every landowner or superintendent who had or has trouble with fence-posts rotting out.

First class fence-post material, such as cedar, arbor vitae, chestnut, etc., is growing too scarce and high-priced for the general user, and in consequence there remains the alternative to use cheaper but much shorter lived woods for fencing. This is being done to a large extent even now, and conditions will become more extreme as the years go on. To use short-lived varieties of wood for posts without some preservative treatment, is folly and waste, as such posts have a very short existence and soon rot completely. While the price of the short-lived posts may be low, the labor charge and time investment for building the fence is just as high as when the best quality of posts is

used, and this becomes a total loss when the posts are removed owing to decay. On the other hand, when they are treated with an efficient and concentrated wood preservative, even the cheapest kind of sap pine, hemlock, cottonwood, etc., will last a good many years, and the moderate cost of treatment is repaid several times over by the added life of the posts.

This circular outlines six different methods of fence-post treatment, thus making it possible to select that particular method which will best suit the conditions of each individual case, taking into account the money available and also the more or less extreme conditions that the posts are expected to withstand. It also includes illustrations of simple treating tanks for fence-posts and shingles, illustrations on proper methods of piling for seasoning and reproductions of specimen fence-posts preserved for fifteen and twenty years. True wood preservation undoubtedly offers the most practical means for avoiding or largely reducing the annual outlay for lumber, labor costs and time, and surely there is pleasure in the knowledge that the wood structures, whether fences or buildings, are of a more permanent character wherever timber preservation is practiced. The returns on investments for a good wood preservative are never in doubt, and they increase directly with the increase in cost for structural timber or posts. Timber cannot last forever by any known method, but a good wood preservative adds so many years to the usual service life of the wood, be it posts or lumber, that the returns will amount to 100 per cent. or more on the total original cost of the wood structure.

THE DEBT OF THE MANUFACTURER TO THE CHEMIST

By HARRY J. SKINNER, Vice-President, Arthur D. Little, Inc., Boston, Mass.

Part of a paper presented before the Congress of Technology.

The enormous progress and changes which have taken place in industry and commerce in the course of the past century may to a large extent be justly attributed to the work of chemists.

The average manufacturer, especially if his process is a mechanical one, regards chemistry as something which has to do with drugs and chemicals and has no direct bearing upon his own problems. That manufacturers fail to appreciate their indebtedness to the chemist and how he can improve the efficiency of their processes by studying the chemical properties of their materials is due largely to the fact that the older generation of manufacturers started as factory hands and have worked themselves up through the various grades to managerships and presidencies. Their methods have been rule-of-thumb methods and science has had no meaning to them. Their aim was to make money and the efficiency of their processes was a secondary consideration.

With the growth resulting from the combination of capital and the technically trained men which our universities are turning out, conditions are taking on a new aspect. The larger manufacturers, realizing their debt to the chemist and also that there are still unsolved problems in every factory, are securing the benefits of scientific advice. The smaller manufacturer will soon be forced to the same procedure or he will lose in the struggle for industrial existence. The rule-of-thumb method is passing. Guesswork is being replaced by scientific knowledge, and more and more consideration is being given to the underlying principles of the manufacturing processes.

Manufacturing operations based upon chemical processes require control at each step to maintain efficiency. Those based upon mechanical processes, but still dependent upon "material," demand rigid inspection and control of every material entering into or affecting the cost of the finished product.

All this is the work of the chemist or the testing engineer. It should be his duty to see that every material is purchased on a basis of quality and not of brand, that the finished product meets the proper requirements, and that the yields are as near theoretical as possible.

One mistake common to both the manufacturer and the chemist themselves should be pointed out. Many manufacturers, having been converted to the idea that a chemist can be of assistance in the operation of their plants, oftentimes will employ a recent technical graduate and expect him to solve any question in chemistry. This is an injustice to the young chemist and to the profession itself.

Alan A. Claflin in a recent article has said:

"The employment of a scientific man does not mean the engaging of a recent technical graduate at a salary of fifteen to twenty dollars a week to test raw materials and report results which are probably erroneous, to a foreman who does not understand them, but it means having a man of mature experience as a chemical adviser with two or three recent graduates as working assistants."

No words could be truer or better expressed. The manufacturer does not hire a bookkeeper without actual experience to keep his accounts, neither does he engage a lawyer just out of law school to look after his legal affairs. Then why should he expect the young graduate with a large amount of theoretical knowledge and with limited experience to be able to solve effectively the problems which have been troubling him for years?

This condition of affairs is really a serious one and has much to do with the attitude which the average manufacturer takes toward the chemist. It also accounts for the difference of the manufacturer in applying chemical science to his problems, and not until the true relation between the chemist and material is more fully realized will the real debt of the manufacturer to the chemist become appreciated.

C. S. Dodge, Lowell, Mass., announces that his shop will be closed for the annual vacation and for repairs from August 19th to September 5, 1911. In anticipation of future needs, they suggest that urgent orders be forwarded in time for fulfillment before August 19th. Such orders will be promptly and carefully executed.

Recent Textile Patents

CLOTH. Apparatus for Extracting Liquid from. 996,637. David Gessner, Worcester, Mass.

CLOTH CUTTING Gage. 997,229. Dora L. Baumgarten, Seattle, Washington.

CLOTH CUTTING Machine. 997,170. Moritz Wolff, Potsdam, Germany.

DYEING APPARATUS. 996,463. Thomas H. Daniels, Manchester, England.

DYEING APPARATUS. 997,360. August Amrein, Philadelphia, Pa.

DYEING. 996,396. Felix Binder, Mulhausen, Germany.

DYEING MACHINE. 996,514. Jesse M. Payne, Phoenix, Ala.

DYEING YARN. 996,761. John C. Hebden, Providence, R. I., and Frederick H. Daniell, Franklin, N. H.

EMBROIDERING Machine. Shuttle Mechanism for. 996,285. Morris Schoenfeld, Germany.

EMBROIDERING Machine. 997,365. Arnold Bosshard, Arbon, Switzerland.

FABRIC. Preparing Backgrounds on Pile. 997,101. Rebecca T. Swenning, Los Angeles, Cal.

FABRIC PRESSING Machine. 996,790. Tom Patchett, Stoneham, and James W. Burke, Wakefield, Mass.

FABRIC. Adhesive. Frederick J. Gleason, Walpole, Mass.

FABRIC-ROLL-EDGE Protector. 996,510. George J. Oltsch, South Bend, Ind.

FABRICS to Rollers. Means for Attaching. 996,333. Stewart Hartshorn, Short Hills, N. J.

FIBROUS Absorbent Resilient Material and Making it. 996,494. Frederic D. Lovell, Tampico, Mexico.

FIBER MATERIAL and Producing Same. 996,225. Viggo Drewsen, New York.

FIBROUS Materials Preparatory to Spinning. Apparatus for Condensing. 996,557. Bruno Bohle, Werdau, Germany.

HEDDLE. 997,283. William Fehr and Jacob Kaufmann, Philadelphia, Pa.

HOSIERY. 996,964. Robgert C. Blood, Philadelphia, Pa.

KNITTING MACHINE Pattern Mechanism. 996,059. Wilson W. Burson, Rockford, Ill.

LOOM BOX Motion. 996,669. Alonzo R. Patten, Fall River, Mass.

LOOM Shedding-Motion. 996,193. Secondo Arienta, Totowa, N. J.

LOOM. Power. 996,423. Fritz Nitschelm, Audincourt, France.

LOOM SHUTTLE. 996,296. Edward S. Stimpson, Hopedale, Mass.

LOOMS. Warp Stop Motion for. 996,297. Melvin L. Stone, Lawrence, Mass.

RIBBON FEEDING Mechanism. 997 285. Harry C. Gammeter, Collinwood, O.

SPINDLE. 996,530. Alfred Seeley and Herbert Holt, Rochdale, England.

SPINNING OR Twisting and Balling Machine. 997,128. Henry W. Herbst, London, England.

SPINNING, Doubling and Like Operations. Apparatus for. 997,770. Sebastin Ziani de Ferranti, Grindleford, England.

SPOOLING MACHINE. 997,152. James P. O'Connell, Crompton, R. I.

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RECENT TEXTILE TRADE MARKS REGISTERED

"Flint." Cotton yarns. Flint Mfg. Co., Gastonia, N. C.

"Wolly-Boy." Boys' outer clothing. Becker, Mayer & Co., Chicago, Ill.

"Holly." Knitted goods. Strawbridge & Clothier, Philadelphia, Pa.

"Getmor." Hosiery. The Getmor Hosiery Mills, Reading, Pa.

"B. S." Knitted underwear. Elk Knitting Mills Co., Philadelphia, Pa.

"Sugar." Jute bagging for covering cotton. Young & Metzner, Long Island City, N. Y.

"Keltic." Woolen piece goods. S. Stein & Co., New York.

"Midget." Hosiery. Marshall Field & Co., Chicago, Ill.

"Cherub." Hosiery. Marshall Field & Co., Chicago, Ill.

"Rough and Ready." Hosiery. Carson, Pirie, Scott & Co., Chicago, Ill.

"Roberdel" Dress ginghams. Roberdel Mfg. Co., Rockingham, N. C.

"Betalph" Underwear and hosiery. B. Altman & Co., New York.

Whitestoke. Woven underwear. Whitestoke Underwear Co., Ltd., London, England.

"Mochette." Gloves and hosiery. Julius E. Wunsch, New York.

"Dorothy." Underskirts. Henry K. Deisher, Kutztown, Pa.

"Thistle-Down." Yarn. The H. B. Claflin Co., New York.

"Monibak." Hosiery. The Vaughan Knitting Co., Pottstown, Pa.

"Evermore." Cotton piece goods. Wm. R. Moore Dry Goods Co., Memphis, Tenn.

"Dekarator." Flannel piece goods. Wm. R. Moore Dry Goods Co., Memphis, Tenn.

"Wonder Wear." Hosiery. James A. Houston Co., Boston, Mass.

"Leader." Hosiery. Excelsior Knitting Mills, Union, S. C.

"Shelco." Lace curtains, etc. The Sheldon Dry Goods Co., Columbus, O.

"Alliance." Jute bagging for covering cotton. Young & Metzner, Long Island City.

"White Lily." Hosiery. E. M. Townsend & Co., New York.

"Pall Mall." Hosiery. Chas. Chipman's Sons, Easton, Pa.